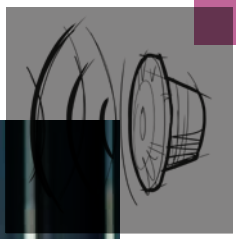
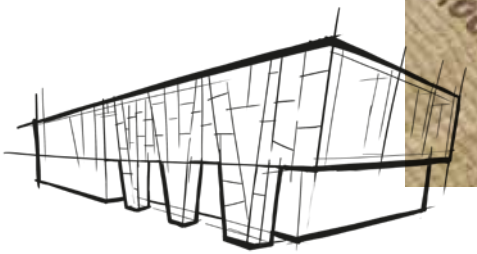
Flat Roof Acoustic Reference Guide



ROCKWOOL®

Contents



Flat Roof Acoustic Reference Guide

Complete ROCKWOOL Acoustic Flat Roof System used at Stopsley High School to achieve R_w 44dB

Introduction

As part of the building envelope modern flat roof systems play an important part in controlling noise that can either enter or leave the building.

As today's buildings are often located in built up areas, unwanted noise from road, rail, construction sites and air traffic all have the potential to disrupt our home, work and learning environments.

ROCKWOOL Flat Roof systems significantly reduce unwanted noise and support in creating a more comfortable internal environment. There are many building types that benefit from ROCKWOOL Flat Roof acoustic systems and these include:

Schools

40 years of research has shown that noise and poor acoustics in schools can:

- Lower pupils academic performance
- Compromise classroom control
- Damage teachers' health
- Disadvantage children with special needs

In 2003 the department for education introduced a new acoustic performance standard for schools under the Building Regulations - Building Bulletin 93 (BB93). In 2015 this was re-written and published as: Acoustic Design of Schools: Performance Standards, Building Bulletin 93.

Whether it is reducing noise entering the school building, removing disruption from rain noise or preventing noise from breaking out, ROCKWOOL can provide a number of tested solutions which achieve the requirements of BB93.

Healthcare

The Department for Health recognises that good acoustic design in healthcare facilities brings a number of benefits and these are covered in the Health Technical Memorandum 08-01: Acoustics (HTM 08-01). Good acoustic conditions play a key part in patient recovery whilst also providing better working conditions for staff.

ROCKWOOL Flat Roof systems can support in creating a healthier acoustic environment, providing the right internal conditions for both patients and staff.

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ROCKWOOL can provide a number of tested solutions which achieve the requirements of BB93.

Offices and Commercial Properties

Many of today's commercial properties are located in heavily built up areas and therefore prone to many types of noise pollution. Effective ROCKWOOL Flat Roof acoustic insulation can support in creating a distraction-free environment, making employees more productive.

Leisure Facilities and Entertainment Venues

Acoustic design is not always about stopping the transfer of sound. In theatres, concert halls and stadiums it is often about the quality of the acoustic performance and creating an environment that offers the audience a great experience.

ROCKWOOL Flat Roof acoustic systems can support in controlling sound levels, ensuring the desired acoustic ambience meets the design requirements.

Industrial and Manufacturing Facilities

Often sources of noise pollution, industrial facilities can impact on other buildings that are in close proximity. Using ROCKWOOL Flat Roof acoustic solutions within the building envelope will reduce sound from escaping the building, lowering the impact on the surrounding environment. Tested ROCKWOOL systems could be used to support planning applications for this type of facility.

Many Other Benefits

As well as offering high performing acoustic solutions ROCKWOOL Flat Roof products offer a wide range of other benefits which include:

- **Superior Fire Resistance**
- **Long-term, Stable Thermal Performance**
- **Vapour Permeability**
- **Sustainability**

Complete ROCKWOOL Acoustic Systems

With airborne sound reduction levels ranging from 40-50dB complete ROCKWOOL flat roof acoustic systems provide an array of high performance options suited to any project.

The following tables provide performance data for both airborne sound reduction and rain noise intensity in line with thermal performances ranging from 0.25 - 0.14 W/m²K.

AIRBORNE SOUND REDUCTION

ROCKWOOL System: HARDROCK® Multi-Fix (DD)

Base Layer (mm)	Upper Layer (mm)	Predicted Airborne Sound Reduction (dB)		U-value (W/m²K)
		1.2mm Single Ply	2 Layer Bitumen	
150	-	41	43	0.25
170	-	44	46	0.22
185	-	45	46	0.20
150	60	46	47	0.18
150	85	47	48	0.16
150	105	48	48	0.15
150	115	48	49	0.14

The above table shows predicted values which have been calculated using the data provided in test report: DPA Cauberg - Huygen 20151078 - 03.

The acoustic data shown in both tables is based on a warm flat roof construction which includes the following components:

- 0.7mm Steel Deck
- Vapour Control Layer

RAIN NOISE INTENSITY

ROCKWOOL System: HARDROCK® Multi-Fix (DD)

Base Layer (mm)	Upper Layer (mm)	Predicted Rain Noise Intensity (L_{IA}-dB)	
		1.2mm Single Ply	2 Layer Bitumen
150	-	55.4	54.2
170	-	54.6	53.6
185	-	54.1	53.2
150	60	53.2	52.3
150	85	52.5	51.7
150	105	52.0	51.3
150	115	51.8	51.1

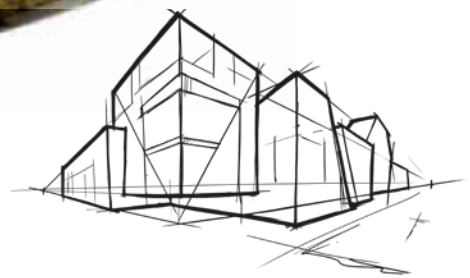
The above table shows predicted values which have been calculated using the data provided in test report: BRE 241438 L707 - 008.

SOUND ABSORPTION

ROCKWOOL System: ROCKWOOL® Acoustic Infill

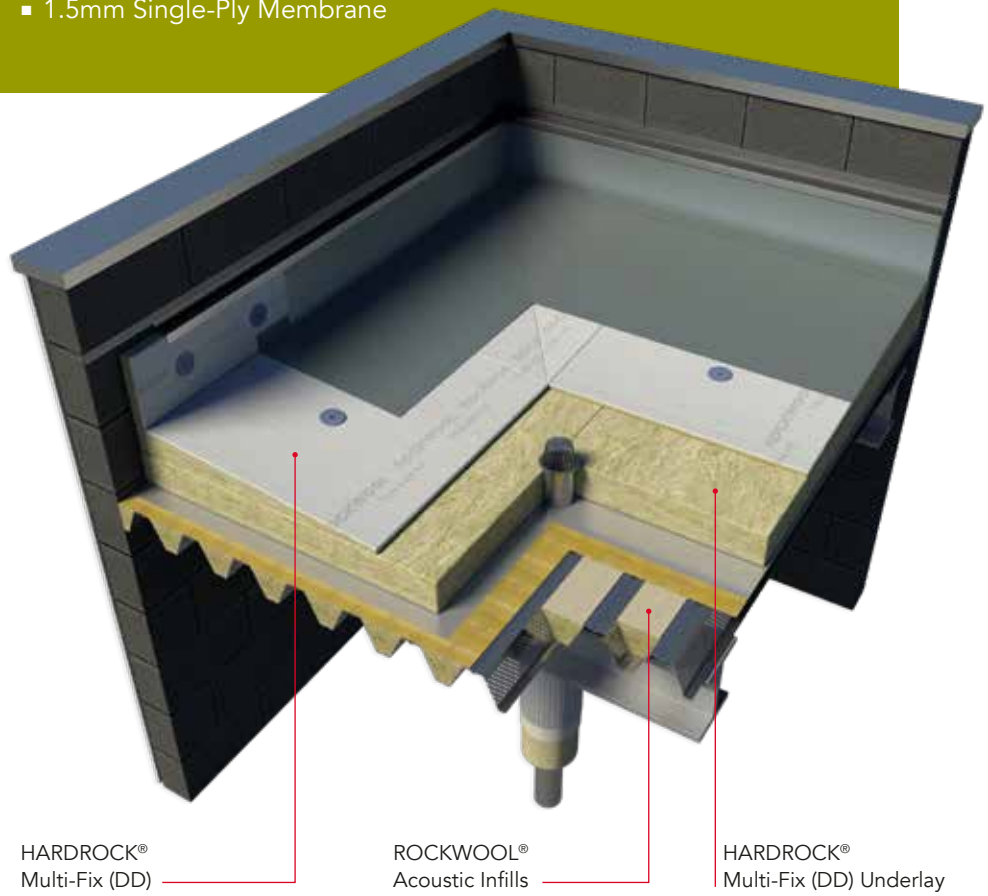
Sound Absorption Coefficient Frequency (Hz)						Weighted Sound Absorption Coefficient (α_w)	Noise Reduction Coefficient (NRC)	Absorption Classification Class
125	250	500	1K	2K	4K			
0.55	0.95	1.00	0.90	0.60	0.45	0.60(LM)	0.9	C

The values shown are actual test results as shown in Test Report: C/06/5L/3434/2.



The acoustic data shown is the result of testing that was carried out on a warm flat roof system which included the following components:

- 0.7mm Tata D60 Perforated Deck (13% open area)
- ROCKWOOL® Acoustic Infill
- 0.22mm Vapour Control Layer
- 210mm ROCKWOOL Hardrock
- 1.5mm Single-Ply Membrane



ROCKWOOL Limited
Pencoed
Bridgend
CF35 6NY

01656 862 621
info@rockwool.co.uk

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