

## Hardrock Dual Density Range

High performance fire and acoustic insulation boards for warm flat roofs

- Plain roofing board
- Tissue faced roofing board
- SPA roofing board

The Hardrock Dual Density range of roofing boards are manufactured using Rockwool's unique dual density technology. Produced with a robust, high density top surface layer to provide improved point load compressive resistance.

The boards offer the ideal non-combustible, acoustic and thermal insulation solution for most types of roof deck, when combined with single ply or high performance built-up roofing systems.

### Typical applications

Single ply mechanically fastened membrane systems

- Faster to install
- Fewer insulation fasteners

Single ply fully adhered membrane systems

- Chemically inert – no taping of joints required
- Approved membrane systems

Built-up felt roofing systems

- 3G layer not required



Typical project using Hardrock Dual Density

### High performance insulation

- High strength  
Improved point load compressive resistance
- Non-combustible
- Fire resistance up to 2 hours (see page 4 for details)  
Tested and assessed by BRE/LPCB  
Listed as LPCB approved product  
LPS 1181: Part 1 Grade EXT-A rated constructions
- Acoustic performance  
Excellent sound reduction and absorption  
Rain noise solutions  
Solutions to BREEAM Schools 2008
- Dimensionally stable
- Cantilever performance
- Suitable for new build and refurbishment



Certificate No FM 02262



Certificate No EMS 70301



0086-CPD-461281 (plain)  
0086-CPD-473342 (SPA)



LPS 1181: Part 1  
Certificate NoS: 022g/01, 022g/02



The following NBS Plus clauses include  
Hardrock Dual Density: J41-10, 425  
J42-10, 425

nbsPlus

# Description, performance and properties

Application of Hardrock Dual Density Range	Products	Page No
<b>1. Single ply</b>		
Mechanically fastened	Hardrock Dual Density (Plain or Tissue faced)	6
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## Dimensions

Hardrock Dual Density roofing boards are manufactured in the following sizes:

### Plain, Tissue faced and SPA boards

1200 x 1000 mm

Standard uniform board thicknesses range from 50 mm to 150 mm (170mm is available in plain or tissue faced). Greater thickness requirements are achieved by double-layering (see page 3: U-values). 30 mm thickness Hardrock is available for use with perimeter upstands.

## Dimensional stability

Hardrock Dual Density roofing boards are dimensionally stable when tested to EN 1604. Therefore they do not exert any undesirable stress on the waterproof membrane.

## Standards and approvals

Rockwool Hardrock Dual Density roofing boards comply with the requirements of BS EN 13162: 2001, 'Thermal Insulation products for buildings Factory made mineral wool (MW) products specification.'

### European Union of Agrément (UEAtc)

Hardrock Dual Density roofing boards have been assessed by the British Board of Agrément to the UEAtc Technical guidelines MOAT No 50: 1992 'Thermal insulation systems intended for supporting waterproof coverings on flat and sloping roofs'.

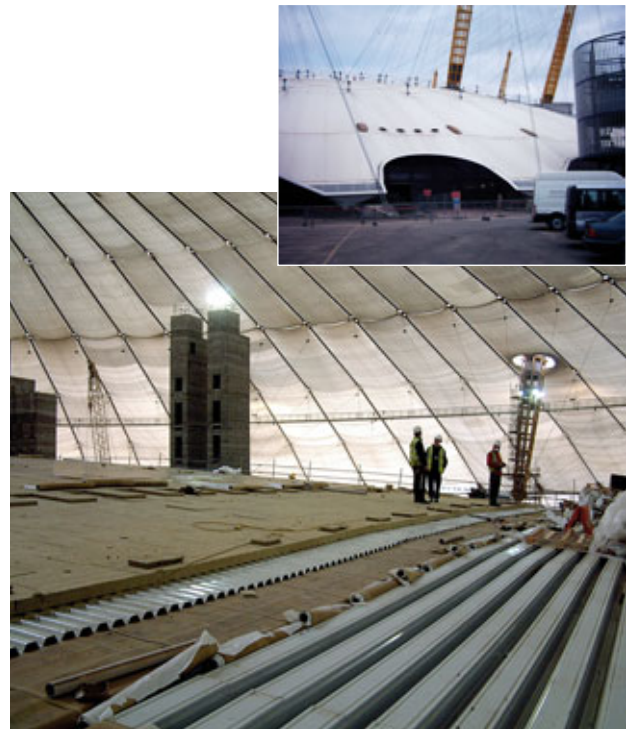
Hardrock Dual Density roofing boards have been tested for the effects of mechanical stress and have achieved Classification C 'Roof accessible to pedestrian traffic, may be used where frequent maintenance of equipment is envisaged' (refer also to page 8). The boards have also been assessed for cantilever and free spanning capabilities.

## Factory Mutual

Hardrock Dual Density (unfaced +tissue faced) roofing boards are Factory Mutual approved for Class 1 insulated steel deck constructions. Approval Report No. J.I. 3015604.

## Resistance to moisture

Hardrock Dual Density roofing boards are water repellent and unaffected by the freeze/thaw cycle.



O2 Dome, London. Hardrock Dual Density and Rockwool Acoustic Membrane. 30,000m<sup>2</sup>

# Thermal performance and U-values

## Thermal Conductivity

The Thermal Conductivity ( $\lambda$ ) of Hardrock Dual Density roofing board is 0.039 W/mK.

## U-values

The following table provides typical U-values attained using various thicknesses of Hardrock Dual Density roofing boards in combination with mechanically fastened single ply membrane systems.

## Typical Constructions for Use with Single Ply Membrane System

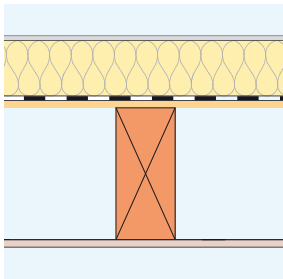
U-value <sup>1</sup> (W/m <sup>2</sup> K)	Fig 1	Fig 2	Thickness <sup>3</sup> (mm)	Fig 3	Fig 4
0.25	135	150		135	150
0.22	170 <sup>2</sup>	170 <sup>2</sup>		170 <sup>2</sup>	170 <sup>2</sup>
0.20	170 <sup>2</sup>	180 (30+50)		170 <sup>2</sup>	185 (50+135)
0.18	190 (95+95)	200 (50+150)		190 (95+95)	210 (105+105)
0.16	220 (85+135)	230 (95+135)		220 (85+135)	235 (85+150)
0.13	270 (135+135)	285 (135+150)		270 (135+135)	285 (135+150)

1 Calculations assume that insulation and membrane are of the telescopic type.

2 Hardrock 170mm is only available in plain or tissue faced.

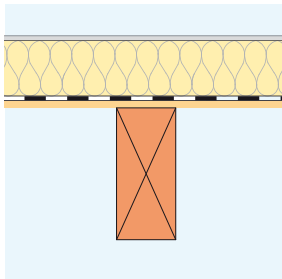
3 Figures in brackets indicate the double layered solution which is required to achieve the U-value.

Figure 1



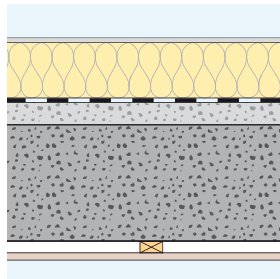
19mm timber deck with 12.5mm plasterboard and skim fixed to timber joists

Figure 2



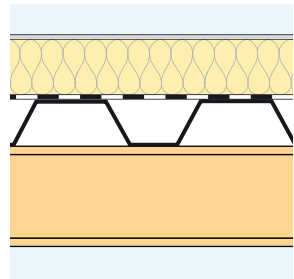
19mm timber deck without ceiling

Figure 3



150mm dense concrete deck and 50mm screed with suspended 12.5mm plasterboard ceiling

Figure 4



Troughed steel decking without underlining

## Part L: 2006 Edition U-value requirements for insulation on flat roofs:

Extensions: 0.20 W/m<sup>2</sup>K

Renovation and repair work: 0.25 W/m<sup>2</sup>K

New build requirement could range between 0.20 and 0.18 W/m<sup>2</sup>K to achieve a 20-28 % improvement in energy performance standards.

Republic of Ireland Newbuild and Extensions: 0.22W/m<sup>2</sup>K

Part L: 2010 Proposals (New Build + Ext): 0.16W/m<sup>2</sup>K

2014 Proposals: 0.13 W/m<sup>2</sup>K

# Fire Performance

## Fire

Rapid spread of fire not only destroys buildings, but can also cost lives and ruin a business. Smoke and toxic fumes can hinder escape and rescue. When specifying insulation materials, careful consideration should be given to their expected characteristics and performance when exposed to fire, including any tendency for producing toxic emissions which may contaminate water courses and the general environment.

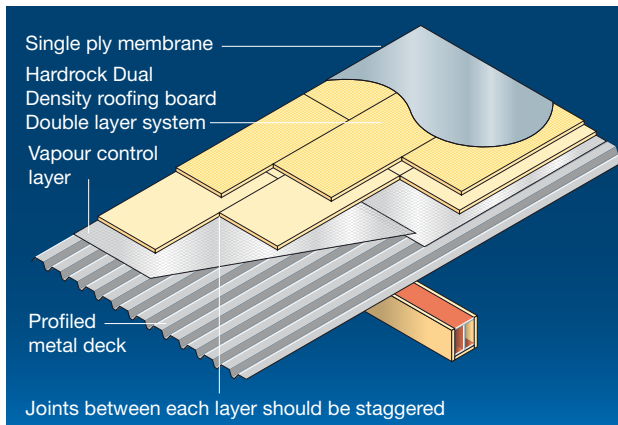
Hardrock Dual Density roof insulation boards can offer a high level of fire protection and both plain and tissue faced options comply with the non-combustible requirements of UK Building Regulations and the Loss Prevention Certification Board (LPCB) – certificate No. 022e

### LPCB Approvals

Roofing constructions incorporating Hardrock Dual Density boards have achieved the highest possible classification to LPS 1181:Part 1 by successfully passing the Reaction-to-Fire Part 1 test and the more onerous LPS 1208 Resistance to Fire test. Rockwool roofing boards are the only insulation products to have achieved this level of certification with respect to built-up warm flat roofing constructions.

The following diagram and Table 1 provide details of the typical roof construction tested and the performance expected from various thicknesses of the Hardrock Dual Density insulation. Fire resistance performances of up to 120 minutes (integrity and insulation) to BS 476: Part 21 can be achieved. The insulation must always be installed as a double layered system, the joints between each layer should be staggered and the LPCB approval covers thicknesses up to 210mm. The grades and performances are valid for both flat and tapered (cut-to-falls) systems. Tapered systems are covered by the LPCB approval where a 2 layer system is employed and the minimum thickness of the upper board is 40mm-60mm with a flatboard below. Further details can be found on the LPCB website: [redbooklive.com](http://redbooklive.com) or by contacting Rockwool's Customer Support Unit (tel: 0871 222 1780).

### Typical LPCB approved construction



### Important note to Specifiers

#### Insurance requirements for Protected zones.

External roof areas adjacent to 'Protected zones' as defined by the 'LPC Design Guide for the Fire Protection of Buildings' are required to meet the fire resistance requirements outlined by Appendix B, LPS 1181: Part 1. This allows for three levels of fire resistance EXT -A15, EXT -A30 & EXT -A60 depending on the outcome of the risk assessment. See LPS 1181: Part 1 Appendix B and LPC Design Guide for the Fire Protection of Buildings (Table 2.2) for specific details. Systems that have achieved EXT-A Grade are suitable for use in 'protected zones'.

#### Building Regulations Approved Document B

Where a flat roof is to be used for escape purposes, the construction must achieve a minimum fire resistance of 30 minutes integrity and insulation (i.e. EXT-A30).



Non-combustible Rockwool insulation can prolong the life of buildings and people.



Rockwool products have been widely used for fire protection for the last 50 years. Extra minutes gained by Rockwool products will save lives and property, and reduce environmental damage.

Table 1. LPCB fire approvals to LPS 1181:Part 1 for Hardrock DD roofing boards

Product	Thickness range (mm)	Grade	Fire Resistance		LPCB Ref No
			Integrity (mins.)	Insulation (mins.)	
Glass tissue faced – for mechanically fastened single ply external membranes	100 - 135	EXT-B & EXT-A60	60	60	022g/01
	140 - 205	EXT-B & EXT-A90	90	90	
	210	EXT-B & EXT-A120	120	120	
Glass scrim-faced (SPA) – for fully adhered single ply external membranes	100 - 135	EXT-B & EXT-A60	60	60	022g/02
	140 - 205	EXT-B & EXT-A90	90	90	
	210	EXT-B & EXT-A120	120	120	

# Acoustic Performance

Effective sound insulation is an essential requirement where commercial or industrial operations generate noise levels, which could be harmful to the health or efficiency of the building occupants, or present an environmental nuisance. The control of noise pollution is an ever-increasing problem and one that is best addressed at the design stage. The solution tends to be specific to each building and is dependent on the type and source of the noise, both inside and outside the building. Hardrock Dual Density roofing boards are proven to be the ideal acoustic insulation material for use in warm flat roof construction.

## 1. Sound attenuation

Noise intrusion from heavy traffic or aircraft can be reduced by using Hardrock Dual Density roofing boards as part of the roof system, creating a quieter ambience within the building. The product may alternatively be used to assist containment of the noise source within the same building. For high performance acoustic specifications, the use of a mass layer may be required. The combination of Hardrock Dual Density and Rockwool Acoustic Membrane (RAM) results in improved sound insulation levels across the frequency range.

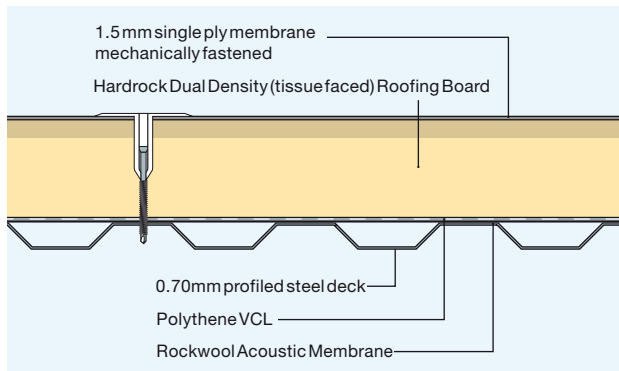


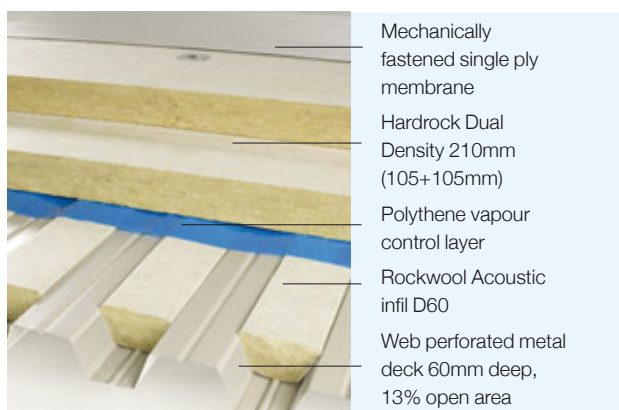
Figure 5 A typical high-performance flat roof detail with Hardrock Dual Density roofing board

The construction denoted by fig. 5 has been acoustically tested using specific combinations of metal deck, Hardrock Dual Density and Rockwool Acoustic Membrane. See the Rockwool Acoustic Membrane data sheet for further details and solutions.

Deck type: 35mm deep profile, 0.7mm thick  
Hardrock Dual Density thickness: 150mm

## 2. Sound absorption

Sound reflection is often a problem experienced in buildings such as manufacturing plants, convention and sports halls. The use of Hardrock Dual Density roofing boards in conjunction with Rockwool Acoustic Infill provides sound absorption within the building, thereby improving the environment for work and leisure. The above construction was acoustically tested and achieved excellent acoustic performance values. See the Rockwool Acoustic Infill datasheet for further details.



The above construction was acoustically tested and achieved excellent acoustic performance values. See the Rockwool Acoustic Datasheet for further details.

## 3. Rain Noise

Impact noise from rain must be considered at an early part in the roof design, due to the fact that this can significantly increase the indoor noise level. Approved Document E – Resistance to the passage of sound, 2004 Addition, requires the construction of new school buildings to meet appropriate acoustic standards. Building Bulletin 93 outlines the methods of compliance. This includes a requirement to minimise the noise of rainfall on lightweight roofs and whilst no limit is set, methods of control must be included and justified to Building Control.

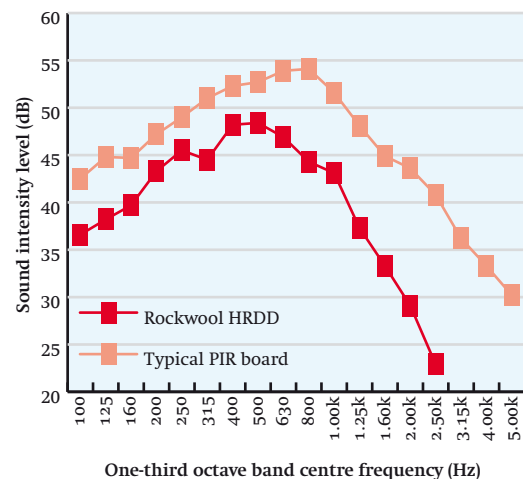
Rain noise testing was undertaken by BRE Acoustics on the following construction using 'Heavy' rain as defined in ISO/CD 140-18

- Sarnafil single ply membrane, type S327-12EL, 1.2mm
- Rockwool Hardrock Dual Density roofing boards, 150mm
- Vapour Control Layer (0.22mm polythene)
- Corus D60 profiled metal deck, 0.7mm

The same roof construction was tested including 85mm PIR insulation board in place of Hardrock Dual Density. The measurements indicate a significant acoustic improvement using Rockwool Hardrock Dual Density roofing boards.

### Results are detailed below:

NB: Lower sound intensity levels represent improved acoustic performance.



Analysis of the results indicates a difference in reverberation sound pressure level of between 8 to 10 dB when comparing the same construction including either Rockwool Hardrock Dual Density or PIR insulation. This is based on typical classroom reverberation times. Acoustically 10 dB is a significant difference and is the equivalent of halving the loudness.

### BREEAM Schools 2008

The Building Research Establishment Environmental Assessment Method (BREEAM) Under Health and Wellbeing, Acoustic Performance (HW17), stipulates that credits will be awarded for new build and refurbishment projects where the indoor ambient noise levels (defined in table 1.1, BB93) during 'heavy' rainfall are exceeded by no more than 20dB in the design calculations. For lightweight flat roof constructions, this most onerous requirement may be achieved by a combination of Hardrock Dual Density roofing boards, Rockfon acoustic ceilings and Rockwool Flexi overlay insulation.

For assistance, including rain noise calculation data for specific project requirements, contact Rockwool Customer Support (0871 222 1780).

# Hardrock Dual Density: Plain and Tissue Faced Boards

Hardrock Dual Density roofing boards are suitable for most types of roof deck. The glass tissue face of Hardrock Dual Density (Tissue faced) roofing board significantly reduces bitumen uptake and ensures an excellent bond between the first layer of membrane and the insulation.

## Typical specifications

### 1 Hardrock Dual Density (Plain or Tissue faced) roofing board with mechanically fastened single layer membranes

The roof insulation is to be Rockwool Hardrock Dual Density (Plain or Tissue faced) roofing board, as supplied by Rockwool Limited, Pencoed, Bridgend, CF35 6NY.

The board size is to be: 1200 × 1000 mm × ..... mm\* thick.

The boards are to be laid strictly in accordance with the manufacturer's recommendations, staggered, tightly butt-jointed and mechanically fastened through the vapour control layer to the deck. Walkways to be fully supported by a load spreading layer applied between the insulation and the membrane.

The advice of the membrane manufacturer should be sought when specifying all aspects of the vapour control layer, fasteners, waterproof covering and construction of walkways.

### 2 Hardrock Dual Density (Plain or Tissue faced) roofing board for use with a warm ballasted roof construction (light access)



Hardrock Dual Density roofing boards applied below mechanically fastened single ply membrane.

The roof insulation is to be Rockwool Hardrock Dual Density (Plain or Tissue faced) roofing board as supplied by Rockwool Limited, Pencoed, Bridgend, CF35 6NY.

The board size is to be: 1200 × 1000 mm × ..... mm\* thick.

The boards are to be loose laid directly onto the vapour control layer, strictly in accordance with manufacturer's recommendations, staggered and tightly butt jointed.

The single ply membrane followed by a fleece filter/cushion layer should both be loose laid and installed over the insulation in accordance with the membrane manufacturer's recommendations.

Ballast to be spread evenly to a minimum depth of 50 mm† and should consist of 20–40 mm diameter, well rounded, ovoid shaped stones, washed free of sand and fine particles.

\*Insert as appropriate

†To be confirmed by calculation conducted by the membrane manufacturer

Additional ballast may be needed for areas which are subjected to greater wind uplift, such as perimeters. This should be confirmed by the membrane manufacturer. The maximum combined weight of ballast and external loading applied to the insulation board should not exceed 360 kg/m<sup>2</sup>.

Walkway routes, where required, should be established prior to laying the single ply membrane and be formed from 50 mm thick precast concrete paving slabs on purpose-made and compatible support pads (Minimum 150 mm diameter).

Walkways to be fully supported by a load-spreading layer applied between the insulation and the membrane.

The advice of the membrane manufacturer should be sought when specifying all aspects of the vapour control layer, fasteners, waterproof covering, fleece filter/cushion layer, and construction of walkways.

### 3 Hardrock Dual Density (Tissue faced) roofing board with built-up high performance bituminous membranes

The roof insulation is to be Rockwool Hardrock Dual Density (Tissue faced) roofing board as supplied by Rockwool Limited, Pencoed, Bridgend, CF35 6NY.

The board size is to be: 1200 × 1000 × ..... mm\* thick.

The boards are to be laid strictly in accordance with the manufacturer's recommendations, staggered, tightly butt-jointed and either fully bonded in hot bitumen or mechanically fastened through the vapour control layer to the deck.

The membrane must be bonded in accordance with BS 8217: 2005. A ventilating sheet (3G) is not required.

The advice of the membrane manufacturer should be sought when specifying all aspects of the vapour control layer, fasteners, waterproof covering and construction of walkways.

### 4 Hardrock Dual Density (Tissue faced) roofing board with approved asphalt membrane

The roof insulation is to be Rockwool Hardrock Dual Density (Tissue faced) roofing board as manufactured by Rockwool Ltd, Pencoed, Bridgend, CF35 6NY.

The board size is to be: 1200 × 1000 × ..... mm\* thick.

The boards should be installed strictly in accordance with BS 8218:1998 Code of Practice for mastic asphalt, BS 8000 and to the manufacturers specifications. Boards to be laid tissue face up to receive the sheathing felt separating layer and asphalt roofing. Insulation boards should be laid staggered tight butt jointed, and either fully bonded in hot bitumen or mechanically fastened through the vapour control layer to the deck.

20mm thick two coat mastic asphalt roofing is to be applied over the sheathing felt / Hardrock Dual Density (Tissue faced) roofing board in accordance with the appropriate Permanite Asphalt specification.

A project dedicated mastic asphalt waterproofing system specification can be obtained directly from Permanite Asphalt Technical Services (Tel: 01629 582213. Fax 01629 583375. email: apd.tech@permanite.com).

# Hardrock Dual Density SPA boards

Hardrock Dual Density SPA is a dual density roofing board for use with fully adhered single ply membrane systems.

The special scrim facing of the board encourages a strong bond between membrane and insulation whilst limiting the amount of adhesive needed.



Patent number 2312695



Application of adhesive to Hardrock Dual Density SPA.

## Typical specification – uniform thickness boards

### 5 Hardrock Dual Density SPA roofing board with fully-adhered single ply membranes

The roof insulation is to be Hardrock Dual Density SPA roofing board, as manufactured by Rockwool Ltd, Pencoed, Bridgend CF35 6NY. The board size is to be 1200 x 1000 x ..... mm\* thick.

The boards are to be laid strictly in accordance with the manufacturer's recommendations, staggered butt jointed, and either fully bonded with an approved adhesive (hot bitumen or cold applied alternative) or mechanically fastened through the vapour control layer to the deck.

The vapour control layer is to be fixed to the deck in accordance with the manufacturer's recommendations.

The boards are to be laid in a clean, dry state and fully protected from water prior to the application of the adhesive.

A single ply membrane which has been tested and deemed compatible for bonding to Hardrock Dual Density SPA is to be applied to the insulation with the relevant adhesive.

Details of the adhesive, its application and other appropriate fixing considerations should be sought from the manufacturer of the single ply membrane.

When applying adhesive by hand roller, lifting of the Hardrock Dual Density SPA scrim corners may occur.

Care should be taken to re-position the scrim prior to the application of the roofing membrane.

### Mechanical fastener type

Where the insulation is to be mechanically fastened, Rockwool Limited recommends the use of fasteners incorporating either a plastic tube washer or, alternatively, a stress plate support thread.

The number of mechanical fasteners per board should be determined by windloading calculations conducted by the membrane manufacturer.

### Taping of board joints

Due to the fact that the product is chemically inert, taping of board joints is not required.

### Tested membrane systems

A list of membranes that have been tested with Hardrock Dual Density SPA and deemed compatible (by both Rockwool and the membrane manufacturer) is available from Rockwool Customer Support (0871 222 1780).

\* Insert as appropriate



A built-up metal roofing construction incorporating Hardrock Dual Density SPA roofing boards has achieved the highest possible classification to LPS 1181: Part 1 (i.e. EXT-A). See page 4 for further details

# Hardrock Dual Density: Design Considerations

## Profiled metal deck installations

### Crown and trough position

Rockwool Hardrock Dual Density roofing boards must be laid with the long edge at right angles to the profiles of the metal deck. Butt joints should occur at the mid-crown position, except where cantilevering is applicable.

### Cantilevering

Rockwool Hardrock Dual Density roofing boards of 60mm or greater thickness may cantilever over a trough. For cantilevering the minimum board thickness is equal to the Maximum trough width divided by 2. The maximum trough width suitable for cantilevering with Hardrock Dual Density is 300mm.

Note: 50mm and 30mm boards may not be cantilevered.



### Free spanning capability

For free spanning, the minimum board thickness is equal to the Maximum trough width divided by 3. The maximum trough Width suitable for free spanning Hardrock Dual Density is 300mm. Where installed trough widths exceed the maximum spanning capability of the Hardrock Dual Density board, provision must be made to provide full support for the insulation.

Note: for 50mm thick boards, the maximum trough width is 75mm.

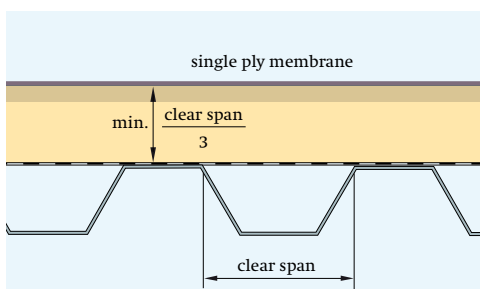


Figure 13 Note that the span to be measured is across the clear width of the trough, and not from centre to centre of the crowns.

### Additional roof loads

#### Plant and machinery

Wherever possible, any roof-mounted plant, such as air handling and refrigeration units, should be positioned on independent upstands bearing directly onto the substrate.

Where this is not possible, and the equipment is to be placed directly onto the finished roof, further protection to spread the load on the Hardrock Dual Density roofing board would be required. In such cases advice should be sought from Rockwool Customer Support (0871 222 1780) and the membrane manufacturer.

## Walkways and access areas

Additional protection to spread the load on Hardrock Dual Density roofing board is also recommended in walkway and access areas. Advice should be sought from the membrane manufacturer on the options available.

## Mechanical fastener type

For the mechanical fastening of Hardrock Dual Density roofing boards to metal, concrete or timber decks Rockwool Limited recommends the use of fasteners incorporating either a plastic tube washer or stress plate support thread (see figures 14 & 15).

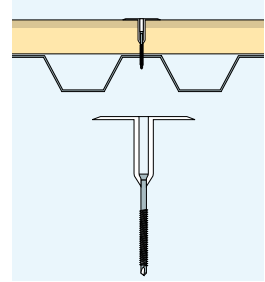


Figure 14 Plastic tube washer and fastener

## Mechanical fastening of insulation

### 1 Single ply mechanically fixed membrane systems

Where the complete roofing system is mechanically fastened (for example single ply), Rockwool Limited recommends that a minimum of one mechanical fastener is used per board (or part thereof) to locate and secure the boards during installation (see figure 16).

This recommendation is based on independent wind uplift tests to determine the wind-induced load on mechanically attached Rockwool boards. The tests comply with the boundary conditions specified in the UEAtc Supplementary Guide for the Assessment of Mechanically Fastened Roof Water Proofing.

The tests conclude that for both the field area and the edge region of flat roofs, sufficient stability is achieved when using one fastener. For the corner region of flat roofs external suction and internal pressure forces of up to 3.5 kN/m<sup>2</sup> must be expected. However, it is universal practice in such vulnerable areas to increase the number of membrane fasteners per m<sup>2</sup>, and also to reduce the distance between the rows of fasteners.

### 2 Fully bonded membrane system

Where the membrane is fully bonded to the insulation surface (e.g. with bitumen or adhesive) the number of mechanical fasteners per board should be determined by windloading calculations conducted by the membrane manufacturer.



Installed plastic tube and washer

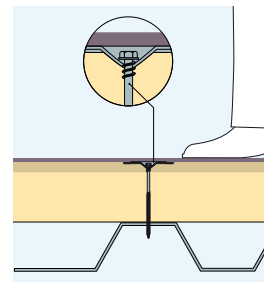


Figure 15 Fastener with stress plate support thread

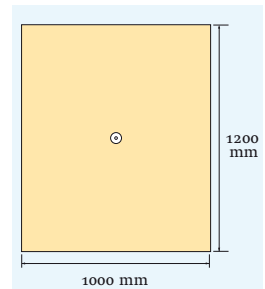


Figure 16 Location of mechanical fastener for securing Hardrock Dual Density board to metal, concrete and timber decks. (See mechanical fastening of insulation).

## Factory Mutual

For Factory Mutual specifications, standard Hardrock Dual Density roofing board should be fixed in accordance with the specification for Class 1 steel deck constructions and in accordance with the F.M. Guide and appropriate F.M. data sheets. Additionally, the insulation boards should be mechanically fixed in accordance with the FM Pre-securement Requirements. Further advice is available from Rockwool Customer Support (0871 222 1780).

## Vapour control layer

The need for a vapour control layer with Hardrock Dual Density roofing boards should be calculated in accordance with BS 5250: 2002 and with reference to BS 6229: 2003 (Code of Practice for Flat Roofs with Continuously Supported Coverings).

## Flat roof design

The roof construction and design should comply with BS 6229:2003 (Code of practice for flat roofs with continuous supported coverings).



## Work on site continued

### Installation

#### General

Hardrock Dual Density roofing boards should be laid with staggered joints wherever possible and tightly butted to avoid gaps. Ensure that the dense layer is used on the upper side towards the membrane. This is clearly marked on the boards as 'Rockwool This side up'.

The use of small pieces of insulation board should be avoided. Care should be taken to clean off all surfaces prior to the laying of insulation boards and membrane.

Appropriate stop battens should be installed to protect open edges of boards. Day joints must be formed at the conclusion of each section of work to seal exposed edges of insulation boards and prevent damage.

#### Membrane installation/fasteners

The membrane should be installed strictly in accordance with the manufacturer's specification and fastening requirements for wind uplift.

#### Built-up high performance bituminous membranes

Built-up membranes should not be laid on insulation boards at temperatures below 5°C unless special care is exercised.

#### Water absorption

Rockwool consists of randomly orientated water-repellent fibres. Wetting will therefore only occur in proximity to its surface.

As Rockwool is diffusion open, boards that become wet during installation must be allowed to dry out naturally, prior to the application of the roof membrane.

#### Cutting Hardrock Dual Density roofing board

Hardrock Dual Density roofing board is easy to cut to shape using a sharp knife or panel saw.

#### Protection of Hardrock Dual Density roofing board during installation

Adequate temporary protection must be provided above the installed Hardrock Dual Density roofing board where any of the following occur: unloading or access points, temporary walkways, stockpiles of roofing materials, waste skips or any other activity that might cause damage to the insulation.

#### Working platform

Under no circumstances may the finished roof be used as a working platform without adequate protection being provided.

Rockwool Limited recommends that either the main contractor or the roofing contractor operate a 'permit to work' system for any follow-on trades in areas where the roof installation is complete.



Hardrock Dual Density can be easily cut and shaped on site where required.



Typical installation of mechanically fastened Hardrock Dual Density (Tissue faced) roofing board, on a profiled steel deck, incorporating a single ply membrane.



Typical installation of a single ply membrane over Hardrock Dual Density roofing boards.



Typical pour and roll application over Hardrock Dual Density Tissue faced roofing boards



Use of the Rockwool Rock Roller trolley allows fast and easy movement of boards across the roof decking

## Storage and handling

Rockwool Hardrock Dual Density roofing boards are fully palletised and wrapped in a polythene shroud for protection during transit and for short term protection if stored outside. For longer term protection the pallets should be stored under a secure waterproof covering. Hardrock Dual Density should be stacked no more than 2 pallets high for safety.

Where craning of pallets to roof level is required, the use of a pallet fork attachment is recommended

## Rockwool Rock Roller Trolley

To facilitate fast and easy movement of the Hardrock Dual Density roofing boards from the loading area to the point of installation on the roof deck, Rockwool Limited have developed a purpose made 'trolley'. Each Rock Roller comes complete with operating instructions, which should be followed by the roofing contractor.

## Specify SPRA

The Single Ply Roofing Association (SPRA) represents membrane manufacturers, associated component manufacturers and specialist subcontractors and aims to ensure the delivery of best value single ply roofing systems, through a quality assured partnership.

By specifying products and specialist installation by SPRA Manufacturer, Associate and Contractor members you can be assured that all parties meet strict quality criteria. Compliance with these criteria and with the Code of Conduct is assessed at application, by annual audit and by random spot checks.

For further information, and to obtain copies of the SPRA Design Guide and other documents, go to [www.spra.co.uk](http://www.spra.co.uk) or call 0115 914 4445



## Preparation work for refurbishment

Unless the existing roof finish is known to be sound and watertight, and the type and condition of the surface suitable for bonding or mechanical fixing of Hardrock Dual Density roofing board, all previously applied finishes and, if necessary, insulation layers should first of all be removed. It is recommended that the specifier/contractor checks the existing levels to ensure that the falls are correct.

## Health and safety

The safety of Rockwool mineral wool is confirmed by current UK and Republic of Ireland health and safety regulations and EU directive 97/69/EC; Rockwool fibres are not classified as a possible human carcinogen..

A Material Safety Data Sheet is available from Rockwool Customer Support (+44 0871 222 1780) to assist in the preparation of risk assessments, as required by the Control of Substances Hazardous to Health Regulations (COSHH).

## Sustainability

As an environmentally conscious company, Rockwool promotes the sustainable production and use of insulation and is committed to a continuous process of environmental improvement.

## Environment

Relying on entrapped air for its thermal properties, Rockwool insulation does not contain (and has never contained) gases that have Ozone Depleting Potential (ODP) or Global Warming Potential (GWP). Rockwool therefore complies with the relatively modest threshold of GWP<5 included in documents such as the Code for Sustainable Homes.

Rockwool Ltd is increasingly involved in recycling waste Rockwool material that may be generated during installation or at end of life.

We are happy to discuss the individual requirements of contractors and users considering returning Rockwool materials to our factory for recycling.



Rockwool Limited reserves the right to alter or amend the specification of products without notice as our policy is one of constant improvement.

The information contained in this data sheet is believed to be correct at the date of publication. Whilst Rockwool will endeavour to keep its publications up to date, readers will appreciate that between publications there may be pertinent changes in the law, or other developments affecting the accuracy of the information contained in this data sheet.

The applications shown do not necessarily represent an exhaustive list of applications for the Hardrock Dual Density range. Rockwool Limited does not accept responsibility for the consequences of using the Hardrock Dual Density range in applications different from those described above. Expert advice should be sought where such different applications are contemplated, or where the extent of any listed application is in doubt.

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## More information

For further details visit our website at [www.rockwool.co.uk](http://www.rockwool.co.uk) or phone the Customer Support 0871 222 1780