

Cool 'n' Comfort™ Blanket and Slab



General Product Information

ROCKWOOL stone wool products are made of basalt, a volcanic stone, which is the world's most abundant natural resource.

ROCKWOOL stone wool products are non-combustible with a melting point more than 1000°C. They are particularly suitable for thermal insulation, fire protection and sound reduction or absorption.

ROCKWOOL stone wool is inorganic and contains no nutritious substance. Therefore it will not be attacked by microorganisms. Stone wool will not rot and does not attract vermin.

No CFCs, HFCs, HCFCs, or asbestos are used in the manufacture of ROCKWOOL stone wool products.

Introduction

ROCKWOOL Cool 'n' Comfort series is designed for single or double skin metal roof, with or without skylight, to satisfy U-value requirements in order to achieve the desired roof thermal transmittance value (RTTV). It is also available with a radiant barrier facing to suit the requirements of all types of roofs

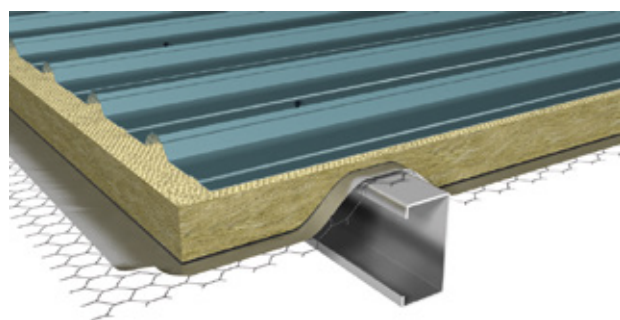
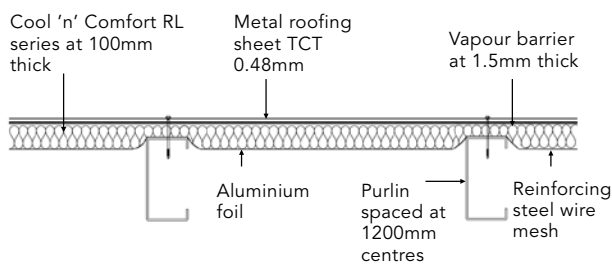
in commercial and industrial buildings.

Cool 'n' Comfort is highly effective in reducing solar heat gain through the roof for non air-conditioned buildings; and where air-conditions are used, Cool 'n' Comfort helps to save energy and reduce energy costs. The unique properties of Cool 'n' Comfort contribute to make an energy efficient, environmentally sustainable and fire safe roofing system, thereby creating a cool, comfortable and safe indoor environment.



Applications

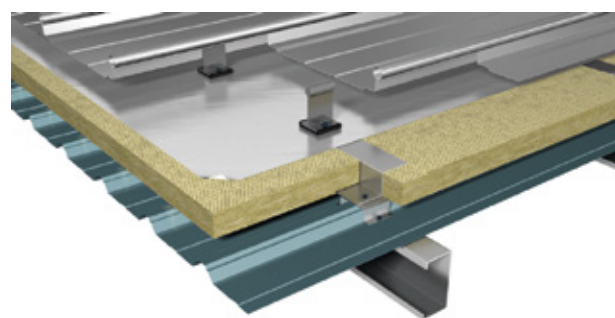
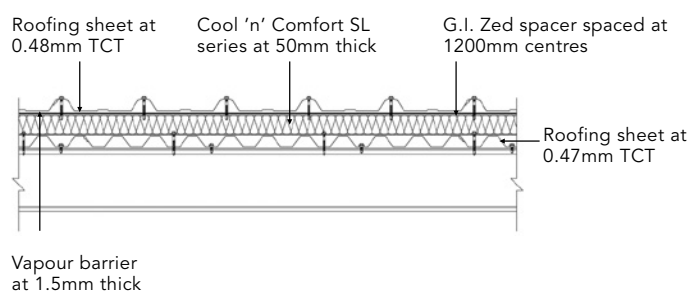
Metal roofing systems are generally categorized as single skin metal roof or double skin metal roof. In single skin roof system, insulation is installed below the metal cladding sheet held by reinforcing steel wire mesh and aluminum foil rolled over purlins. This roofing system is an economically sound option for most industrial buildings. Cool 'n' Comfort RL Series is the ideal non-combustible light weight thermal insulation solution for single skin roofing system.



Single Skin Roof System

The double skin roofing system is a high performance roofing system comprising of an aesthetically designed trapezoidal or standing seam profile metal sheet on the top and a metal trapezoidal tray at the bottom. The two metal sheets are fixed together with a z-purlin creating a gap in the roof space for installation of insulation and vapor barrier. When coupled with Cool 'n' Comfort SL Series stone wool insulation, it boost the performance of the double skin metal roofing system with improved level of thermal insulation, acoustic and fire protection.

Cool 'n' Comfort SL, a semi rigid slab product, is a versatile insulation that is available in various sizes to provide ease of installation and a perfect fit between purlins.



Double Skin Roof System

Note: All systems drawings are not drawn to scale.

Water Repellent

Cool 'n' Comfort Series is specially formulated with a silicone water repellent coated onto each strand of the stone wool fibres. *This special coating allows Cool 'n' Comfort to repel rain water that comes into contact with the product, at the same time ensuring the product's excellent thermal and acoustic performance even after exposure to water.

As Cool 'n' Comfort is commonly applied or left outdoor during installation, the silicone water repellent is added into the product as a standard offering.



Product Range and Packaging

Cool 'n' Comfort comes in the form of blankets or slabs to suit many different metal roofing designs and installation needs.

Cool 'n' Comfort is shrink-wrapped in polyethylene sheets for ease of handling, transportation and storage.



Selected range of blanket products are in compressed roll which gives significant reduction in size compared to folded blankets, thereby further reducing your warehousing cost. Please refer to the local sales representatives on the ranges that are available in compressed roll packaging.

Facings

Cool 'n' Comfort series is available as plain products and additionally with options of foil facing or glass tissue on oneside or two-sided.



**Cool 'n' Comfort SL series
with foil facing**



**Cool 'n' Comfort RL series
without facing**

Standards

Cool 'n' Comfort is designed to meet the requirements of Malaysian Standard, MS1525 (Code of Practice on Energy Efficiency and Use of Renewable Energy for Non-Residential Buildings) and Singapore BCA Green Mark for Residential and Non-Residential (version 4.0).

**Note: Water repellent test standard is based on GBT 10299. For more information, please contact your local representatives.*

Technical Parameters

Product Name	Cool 'n' Comfort RL920	Cool 'n' Comfort RL940	Cool 'n' Comfort SL920	Cool 'n' Comfort SL940	Cool 'n' Comfort SL950	Cool 'n' Comfort SL960	Standard
R-value at 50mm thickness (m ² K/W)	1.39	1.47	1.39	1.47	1.47	1.47	
Thermal Conductivity 20°C λ Value (W/mk)	0.036	0.034	0.036	0.034	0.034	0.034	ASTM C518
Water Absorption (partial immersion (kg/m ²))	1.0	1.0	0.5	0.5	0.5	0.5	EN1609.97
Water Vapor Absorption	Less than 0.04 Vol %	Less than 0.04 Vol %	Less than 0.04 Vol %	Less than 0.04 Vol %	Less than 0.04 Vol %	Less than 0.04 Vol %	ASTM C1104 C1104M
Fire Performance Non Combustibility	A1 Non-combustible						EN 13501-1 BS EN 1182
Melting Point	More than 1000°C						ASTM E794
Form Factor	Blanket	Blanket	Slab	Slab	Slab	Slab	
Thickness (mm)	50, 75, 100						EN 822
Width x Length (mm)	1200 x 5000		600 x 1200				EN 822
Recommended for these common applications	Single skin metal roof for food centre or canteen, usually non air-condition, without walls and highly ventilated environment. Also commonly used in walkways and common pavilion in residential estates	Single skin metal roof for high end residential, to provide a better thermal performance and long term savings on energy bill	Double skin metal roof for residential & commercial buildings for general thermal performance	Double skin metal roof for industrial, warehouse and factory where higher insulation thickness is designed to be slightly compressed for acoustic damping of the metal roof	Double skin metal roof for exhibition hall, school & educational institute for versatile roof design and high durability	Double skin metal roof for concert hall & airport where high acoustic performance on low sound frequencies are required	

Sound absorption coefficient at different Octave Band (50mm thickness)

Product	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC	α _w
Cool 'n' Comfort RL920	0.20	0.60	1.00	1.00	1.00	1.00	1.00	0.90
Cool 'n' Comfort RL940	0.20	0.70	1.00	1.00	1.00	1.00	1.05	1.00
Cool 'n' Comfort SL920	0.20	0.60	1.00	1.00	1.00	1.00	1.00	0.90
Cool 'n' Comfort SL940	0.20	0.70	1.00	1.00	1.00	1.00	1.05	1.00
Cool 'n' Comfort SL950	0.20	0.75	1.00	1.00	1.00	1.00	1.05	1.00
Cool 'n' Comfort SL960	0.30	0.85	1.00	1.00	1.00	1.00	1.05	1.00

* For UL approved products, please contact our local representative.



G00519
G00524
SGBP 2018-1623



G00518
G00520
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G00523



Disclaimer: The information contained in this data sheet is believed to be correct at the date of publication. ROCKWOOL does not accept responsibility for the consequences of using Cool 'n' Comfort™ Blanket and Slab in applications different from those described above.

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Safe 'n' Silent™ Pro



General Product Information

ROCKWOOL stone wool products are made of basalt, a volcanic stone.

ROCKWOOL stone wool products are non-combustible with a melting point approximately 1000°C. They are particularly suitable for thermal insulation, fire protection and sound reduction or absorption.

ROCKWOOL stone wool is inorganic and contains no nutritious substance. Therefore it will not be attacked by microorganisms. Stone wool will not rot and does not attract vermin.

No CFCs, HFCs, HCFCs, or asbestos are used in the manufacture of ROCKWOOL stone wool products.

Applications

ROCKWOOL Safe 'n' Silent Pro is designed and manufactured to achieve excellent acoustic insulation performance in all types of drywall partition configurations. It is recommended to be used for drywall partition applications in hospitals, cinemas, schools, offices, residential and industrial buildings.

Safe 'n' Silent Pro meets the requirements of Noise Criteria (NC) specifications developed by the ROCKWOOL company. NC comprehensively measures the noise levels of a room and with the use of NC ratings, recommends the desired acoustic comfort level of a room/space.

Facings

Optional facing with one or two sided glass tissue is available upon request for perforated wall panel.

For more information, please contact your local representatives.

Packaging and Storage

ROCKWOOL Safe 'n' Silent Pro is shrink-wrapped in polyethylene sheets for ease of handling, transportation, storage and identification.

Products should be stored indoors or under waterproof covering.

Technical Parameters

Product Name	Safe 'n' Silent Pro 330	Safe 'n' Silent Pro 350	Safe 'n' Silent Pro 370	Safe 'n' Silent Pro 380	Standards
Noise Absorption Co-efficient at 50mm (NRC)	0.90	1.00	1.00	1.00	EN ISO 354 / ASTM C 423-01
Fire Performance	Non-combustible / A1 Fire Classification	Non-combustible / A1 Fire Classification	Non-combustible / A1 Fire Classification	Non-combustible / A1 Fire Classification	EN13501-1
Melting Point	More than 1000°C	More than 1000°C	More than 1000°C	More than 1000°C	ASTM E794
*Thermal Conductivity 20°C λ Value (W/mK)	0.036	0.035	0.034	0.033	ASTM C518
R-value at 50mm thickness thickness (m ² K/W) Water	1.389	1.429	1.471	1.515	
Water Absorption (partial immersion)	1.0kg/m ²	0.5kg/m ²	0.5kg/m ²	0.5kg/m ²	EN1609.97
Water Vapor Absorption	Less than 0.04 Vol %	Less than 0.04 Vol %	Less than 0.04 Vol %	Less than 0.04 Vol %	ASTM C1104/ C1104M
Thickness	50, 75, 100mm	50, 75, 100mm	50, 75, 100mm	50, 75, 100mm	EN822
Applications	Recommended for commercial applications such as retail and office partition walls	Recommended for all drywall partition applications	Recommended for dry-wall with high acoustic insulation requirement	Recommended for dry-wall with high acoustic insulation requirements	

* Thermal conductivity values are based on testing conducted in external accredited laboratory in accordance to ASTM C518 : 1991. Test reports are available upon request. For design, it is recommended to use a safety factor of 20% as design value.

* For UL approved products, please contact our local representative.

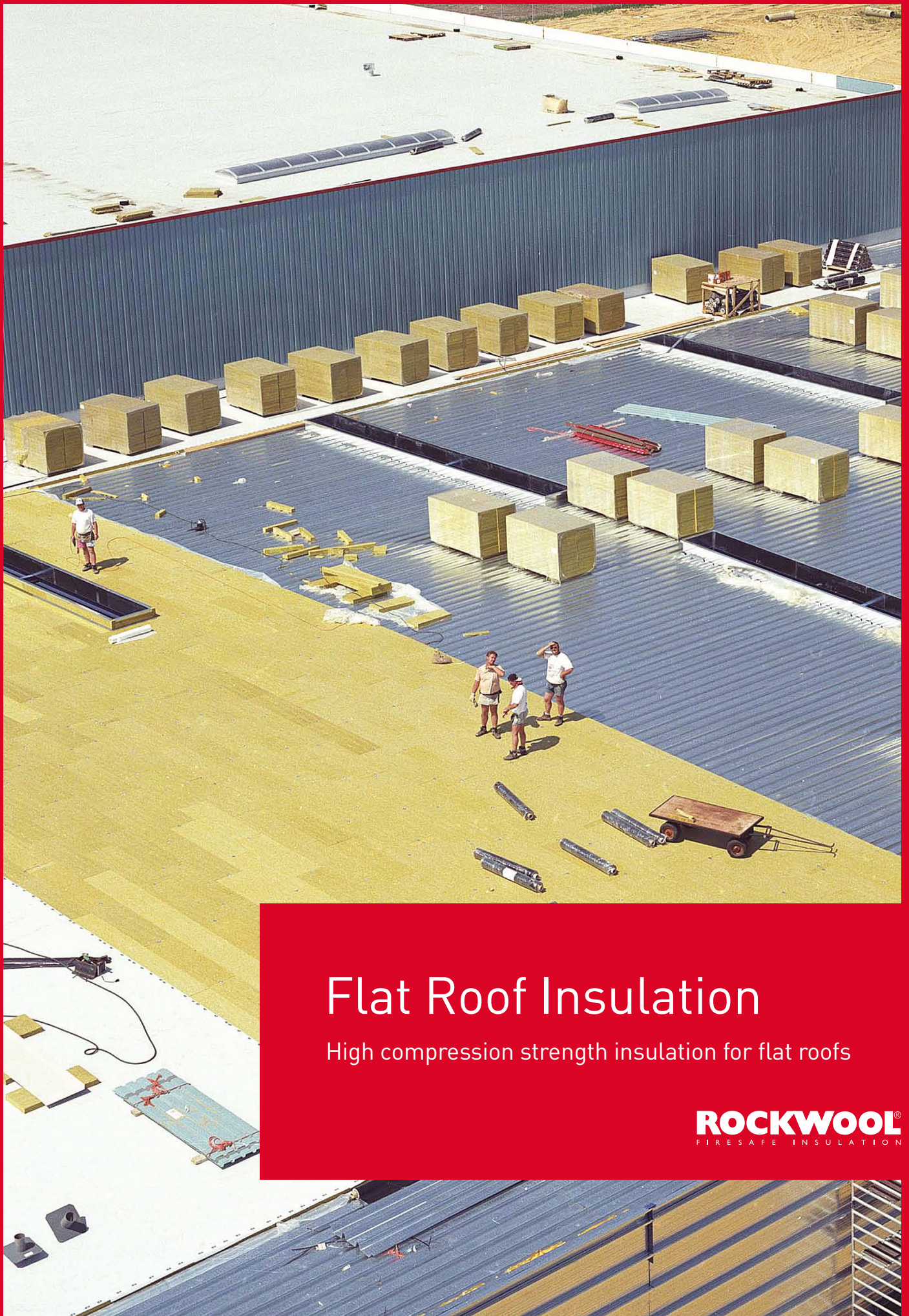


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Flat Roof Insulation

High compression strength insulation for flat roofs

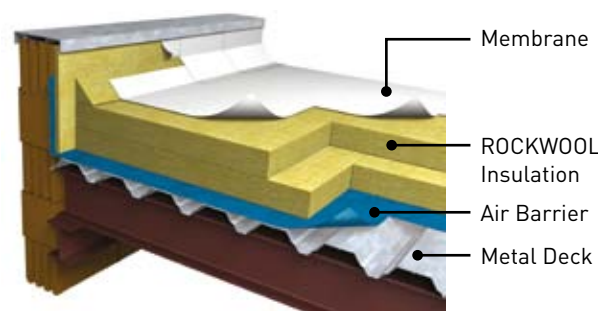
ROCKWOOL®
FIRESAFE INSULATION

Introduction

ROCKWOOL roofing boards provide a one stop solution to roofing insulation requirements. They are suitable for new and re-roofing applications on metal deck or concrete deck. ROCKWOOL insulation is approved by Factory Mutual (FM Approval) for Class 1 roof construction in membrane roofing systems and has proven track records in various international projects. The roofing boards have been developed to offer three types of roofing performances to address the challenges in membrane and metal roofing design for roof designers.

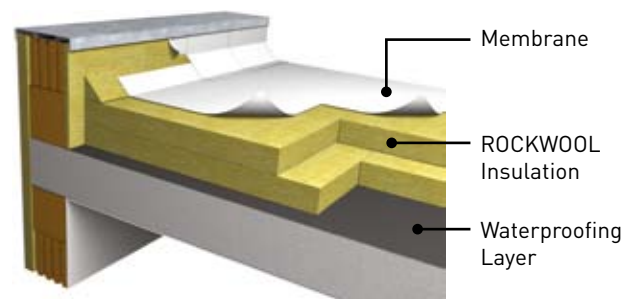
System Description

ROCKWOOL flat roof insulation solutions are specially designed for membrane and metal roof systems.



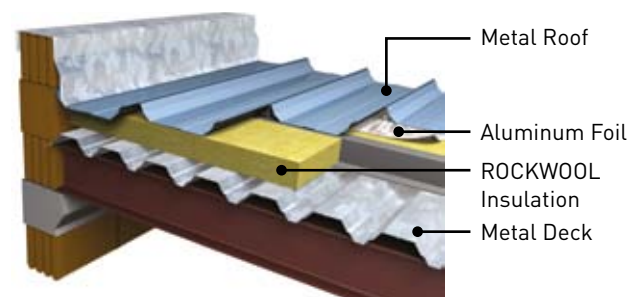
Steel Deck Roof System

ROCKWOOL roofing boards provides an unrivalled fire performance that combines with the excellent mechanical strength to meet all requirements and regulation needs. The superior properties of ROCKWOOL stone wool insulation enhances the overall performance of the membrane roof system in fire, thermal and acoustics, thus producing a durable and energy efficient roofing system. ROCKWOOL roofing boards with mechanically fixed single-ply roofing membrane system on metal deck is ideal for commercial and industrial buildings.



Concrete Deck Roof System

With the high thermal mass of the concrete roof deck, concrete roof have to be adequately protected during summer and winter periods. ROCKWOOL roofing boards provides excellent thermal properties to keep the interior temperature stable and comfortable. Furthermore, ROCKWOOL roofing boards is dimensionally stable and will not be affected by the variation of temperatures over time.



Twin Skin Metal Deck Roof System

The superior sound absorption characteristics of ROCKWOOL roofing boards provides an effective damping of sound resonance within twin skin metal deck. Combined with the added mass of the insulation, ROCKWOOL roofing boards with twin skin metal deck roof system provides an effective acoustic solution for a wide range of applications. ROCKWOOL roofing boards with twin skin metal deck roof system is ideal for educational institutions, airports, convention centres and other buildings where acoustic performance is an important criteria in building performance.

General Insulation Benefits

ROCKWOOL roofing boards offer unrivalled combination of benefits for flat roof constructions.

a. Mechanical Strength

- ROCKWOOL roofing boards offer high resistance to compression and point loading in order to facilitate periodic maintenance of roof.
- The roofing boards effectively maintain a flat surface to allow rain water draining on the roof surface.

b. Fire

- ROCKWOOL roofing boards are non-combustible and can withstand at least 1000°C without melting according to ASTM E749.
- The roofing boards can effectively impede spread of fire and provide the critical extra minutes for occupants to escape.
- ROCKWOOL insulation also provides the highest Euro Fire Classification, A1 rating according to EN 13501-1, as a non-combustible product.
- ROCKWOOL boards do not produce any burning droplets, promote flashover or release excessive smoke during a fire.

c. Thermal

- ROCKWOOL roofing boards are dimensionally stable and ensure constant thermal resistance value. The roofing boards do not contain CFC's or HCFC' insulant that could diffuse from the board over time and reduce its R-value.
- The excellent thermal properties of the roofing boards assist the reduction of condensation built-up by the roofing system.
- ROCKWOOL roofing boards are compatible with all types of roofing membrane. No separation layer is required between the roof membrane and insulation to provide for an optimum design.

d. Acoustic

- The open fibre structure of ROCKWOOL insulation provides excellent sound absorbing properties.
- ROCKWOOL roofing boards are proven as the ideal

acoustics insulation material to provide excellent sound insulation and reduced impact noise for flat roof constructions.

- When laid on perforated metal deck lining, the roofing boards are able to control room reverberation and enhance acoustic quality.

e. Dimensional Stability

- ROCKWOOL roofing boards are made from stone, therefore the thermal coefficient of expansion of the boards is virtually zero.
- The boards do not shrink, warp or deform over time, hence providing the most stable substrate without causing undesirable stress on the roofing membrane.
- The dimensional stability of ROCKWOOL roofing boards eliminates the need for additional mechanical fasteners to prevent differential thermal expansion.



Solutions For Flat Roof Insulation

To provide flexibility in design, cost and usage of membrane roofing system, ROCKWOOL roofing boards offer three different types of roofing insulation system to allow owners, designers and installers to achieve the desired performances of an ideal roof.

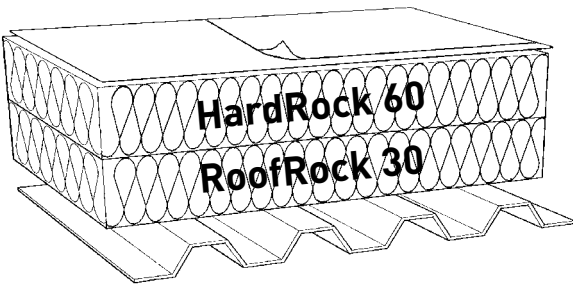
FlatRoof Lite

The Flatroof Lite insulation solution offers a cost effective solution for built up bitumen membrane roof system. It satisfies the basic requirement for thermal, acoustic and fire performances. The system introduces HardRock and RoofRock series of products to allow roof designers to achieve the required mechanical performances of the membrane roof

Performance of FlatRoof Lite Solution

Insulation thickness	100mm
Installation layer / Thickness	HardRock 60 (Top) / 50mm RoofRock (Bottom) / 50mm
Thermal Resistance (R-Value, m²K/W)	2.74
Compression Strength (σ10) kPa at 10% deformation in accordance to EN 826	>30kPa
Point Load (σp) N at 5mm deformation in accordance to EN 12430	>500N

system using the combination of both products. In FlatRoof Lite roof insulation system, RoofRock 30 roofing board with the compression resistance of 30kPa is introduced as the bottom layer of the system. With the superior mechanical strength of HardRock 60 roofing board, the insulation board is employed at the top layer to provide the stability for the overall system. Flatroof Lite is FM approved using the combination of HardRock and RoofRock 30 insulation.



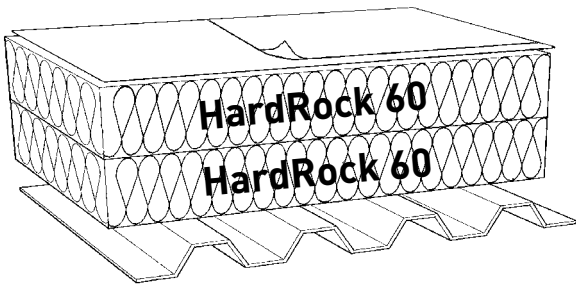
For HardRock specifications, please refer to page 5

Technical Specification for RoofRock 30

Nominal Density	120kg/m³
Thermal Conductivity	0.036W/mK at 20°C (ASTM C518)
Fire Performance	Non-Combustible, A1 (EN 13501-1)
Compression Strength	>30kPa at 10% deformation (EN 826) (σ10)
Delamination Strength	>7.5kPa (EN1607)
Moisture Resistance	Moisture sorption < 1% Vol. (ASTM C1104/C 1104M-95)
Water Resistance	Short-term water absorption < 0.5kg/m² (EN 1609:97)
FM Approval	Class 1 insulated steel deck roof (4450)

FlatRoof Plus

ROCKWOOL FlatRoof Plus insulation system provides superior mechanical strength to meet all challenges on the roof. The 60kPa roofing boards provide resistance to foot traffic during periodic roof maintenance. With ROCKWOOL state-of-the-art technology, HardRock 60 roofing boards delivers the combination of mechanical strength, lighter weight and resistance to fire. When tested to EN 1606, FlatRoof Plus can withstand a permanent load of 3kPa.

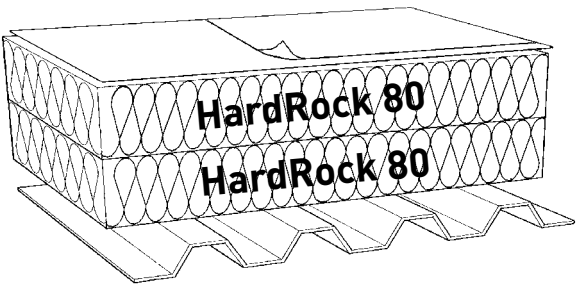


Technical Specification for HardRock 60

Nominal Density	160kg/m³
Thermal Conductivity	0.037W/mK at 20°C (ASTM C518)
Fire Performance	Non-Combustible, A1 (EN 13501-1)
Compression Strength	>60kPa at 10% deformation (EN 826) (σ10)
Point Load (σp)	>500N at 5mm deformation (EN 12430)
Delamination Strength	>7.5kPa (EN1607)
Moisture Resistance	Moisture sorption < 1% Vol. (ASTM C1104/C 1104M-95)
Water Resistance	Short-term water absorption <0.5kg/m² (EN 1609:97)
FM Approval	Class 1 insulated steel deck roof (4450)

FlatRoof Pro

ROCKWOOL FlatRoof Pro insulation system provides an unsurpassed performance over a range of parameters. The fully tested system provides excellent acoustic performance due to the higher mass and damping ability of the boards. This roofing system is proven with excellent track records in Asia. When tested to EN 1606, FlatRoof Pro can withstand a permanent load of 4kPa.



Technical Specification for HardRock 80

Nominal Density	175kg/m³
Thermal Conductivity	0.038W/mK at 20°C (ASTM C518)
Fire Performance	Non-Combustible, A1 (EN 13501-1)
Compression Strength	>80kPa at 10% deformation (EN 826) (σ10)
Point Load (σp)	>700N at 5mm deformation (EN 12430)
Delamination Strength	>7.5kPa (EN1607)
Moisture Resistance	Moisture sorption < 1% Vol. (ASTM C1104/C 1104M-95)
Water Resistance	Short-term water absorption < 0.5kg/m² (EN 1609:97)
FM Approval	Class 1 insulated steel deck roof (4450)



FM Approvals

ROCKWOOL roofing insulation – RoofRock 30, RoofRock 40, HardRock 60 and HardRock 80 are approved products under Factory Mutual (FM).

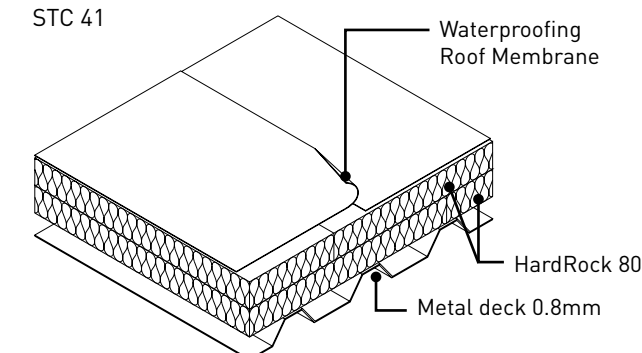
For FM requirements, ROCKWOOL roofing boards should be fixed in accordance with the specification for Class 1 steel deck constructions and in accordance with FM Approved Guide and appropriate FM data sheets. Additionally, the insulation boards should be mechanically fixed in accordance with FM pre-securement requirements. ROCKWOOL FM approved assemblies are available in www.roofnav.com.

Acoustic Performance

ROCKWOOL stone wool is the ideal material for use in achieving a desired acoustic performance. It is made up of fibroporous basalt stone with air-filled interconnected spaces. This structure gives excellent acoustic properties as it significantly diminishes occurrences of vertical sound waves on adjacent surfaces.

Membrane Roof System

STC 41



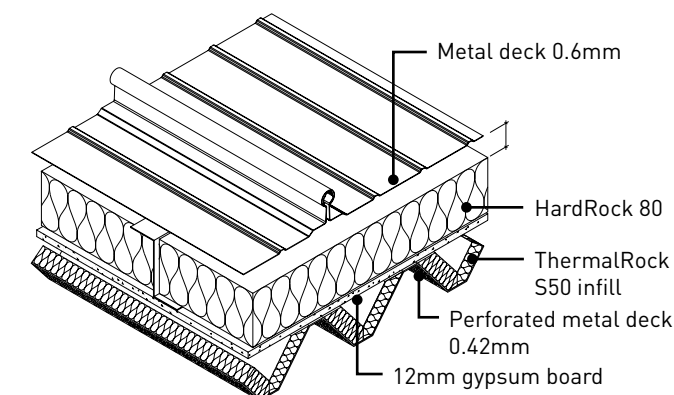
With the high density of ROCKWOOL HardRock roofing boards and the structure of the product, it provides the added mass necessary for effective sound insulation of membrane roof system. Additionally, the single-ply roof membrane coupled with ROCKWOOL stone wool insulation effectively minimizes rain impact noise on the roof system.

1/3 Octave Band Frequency (Hz)	Measured Sound Transmission Loss, TL (dB)
100	20.6
125	19.7
160	21.0
200	25.7
250	32.0
315	34.1
400	37.8
500	40.6
630	41.5
800	41.4
1000	44.4
1250	46.0
1600	46.6
2000	48.6
2500	48.6
3150	47.5
4000	47.0
5000	47.7

For STC 36, 37, 42 and 43 membrane roof systems, please contact your local representative for more details.

Metal Roof System

STC 50



Laboratory testing have proven the added advantage of HardRock roofing boards in metal roof system. With the high sound absorption characteristics of ROCKWOOL roofing boards, it provides an effective damping of sound resonance within the roofing system. To enhance the quality of sound, ROCKWOOL stone wool infills can be introduced inside the trapezoidal of the perforated metal deck to provide added sound absorption for reverberation control.

1/3 Octave Band Frequency (Hz)	Measured Sound Transmission Loss, TL (dB)
50	14.3
63	10.0
80	18.0
100	21.6
125	29.7
160	31.7
200	34.7
250	39.6
315	43.5
400	47.8
500	50.2
630	53.6
800	57.1
1000	61.6
1250	65.0
1600	70.5
2000	72.5
2500	75.8
3150	74.7
4000	74.8
5000	69.4

For STC 43 and 46 metal roof systems, please contact your local representative for more details.

Thermal Performance

U-Value Calculations for FlatRoof Lite, FlatRoof Plus and FlatRoof Pro Insulation Systems

Insulation System	FlatRoof Lite		FlatRoof Plus		FlatRoof Pro	
Description	HardRock 60 & RoofRock 30*		HardRock 60		HardRock 80	
Insulation Thickness	Metal Deck	Concrete Deck	Metal Deck	Concrete Deck	Metal Deck	Concrete Deck
100	0.345	0.341	0.350**	0.345**	0.359	0.345
120	0.209	0.287	0.294	0.291	0.302	0.298
140	0.251	0.248	0.254	0.251	0.260	0.258
160	0.220	0.218	0.223	0.221	0.229	0.227
180	0.197	0.195	0.199	0.198	0.204	0.203
200	0.177	0.176	0.180	0.179	0.185	0.183

Note:

* FOR HARDROCK 60 & ROOFROCK 30 (FLATROOF LITE) INSULATION SYSTEM, THE TOTAL INSULATION THICKNESS REFERS TO THE COMBINED EQUIVALENT THICKNESS OF BOTH PRODUCTS (I.E. 100MM THICKNESS COMPRISES OF 50MM HARDROCK 60 & 50MM ROOFROCK 30)

** REFER TO SAMPLE U-VALUE CALCULATIONS BELOW

(i) FOR DETAILS OF METAL DECK AND CONCRETE DECK CONSTRUCTION REFER TO BUILT-UP IN SAMPLE CALCULATIONS BELOW

(ii) FIXINGS ARE NOT TAKEN INTO CONSIDERATION IN THE ABOVE CALCULATIONS

Sample U-Value Calculations for FlatRoof Plus Insulation System

Description	Thickness (mm)	Thermal Conductivity (W/mK)	Metal Deck Thermal Resistance (m²K/W)	Concrete Deck Thermal Resistance (m²K/W)
Outside surface resistance, Rso	-	-	0.040	0.040
Waterproofing membrane	2	0.160	0.013	0.013
HardRock 60	100	0.037	2.703	2.703
Air Barrier	0.500	0.170	0.003	-
Metal Deck	0.7	50	0.000	-
Concrete Deck	100	2.300	-	0.403
Inside surface resistance, Rsi	-	-	0.100	0.100
Total Thermal Resistance (R-Value)	-	-	2.858 m²K/W	2.899 m²K/W
Total Thermal Transmittance (U-Value)	-	-	0.350 W/m²K	0.345 W/m²K

Reference Projects



Kuala Lumpur Convention Centre, Malaysia

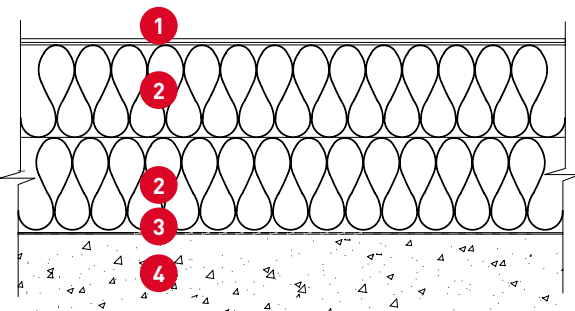


Intel semiconductor plant, Singapore



First Solar photovoltaic plant, Kulim, Malaysia

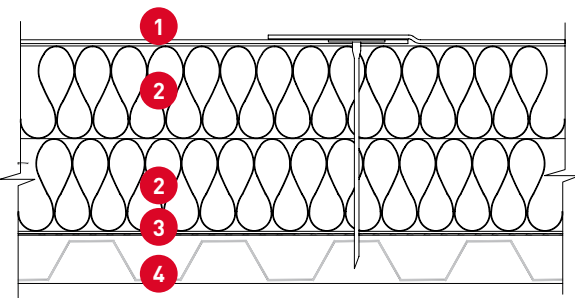
Project: Renewable Energy Corporation (REC) plant, Singapore



ROCKWOOL FlatRoof Pro Concrete Deck System

- 1 Roof Membrane
 - 2 HardRock 80
 - 3 Waterproofing Layer
 - 4 Concrete Deck
- ROCKWOOL roofing boards provide an unrivalled combination of thermal, acoustics and fire performances.
 - The roofing boards were FM Approved, assuring a high standard of quality products while providing compliance towards insurance requirements.

Project : First Solar plant, Kulim, Malaysia



ROCKWOOL FlatRoof Pro Metal Deck System

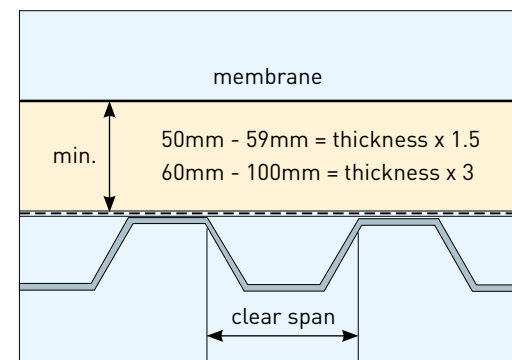
- 1 Roof Membrane
 - 2 HardRock 80 with Tissue Facing
 - 3 Air Barrier
 - 4 Trapezoidal Metal Deck
- ROCKWOOL roofing boards have excellent acoustical properties and were able to achieve STC 41.
 - The boards were secured with insulation fasteners into the concrete or metal deck, hence allowing fast installation to reduce construction time.

Design Considerations

Clear Span

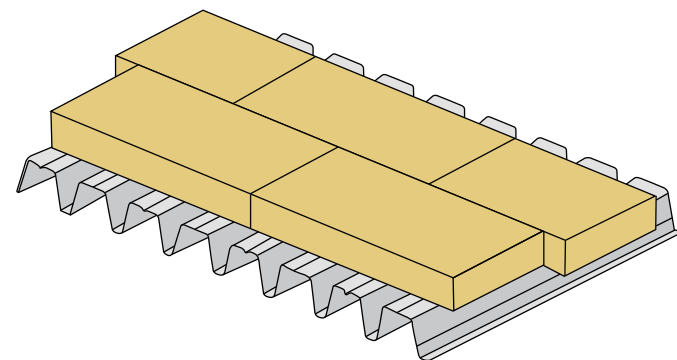
ROCKWOOL roofing boards between the thickness of 50mm and 59mm shall have the maximum clear span of = thickness of insulation board x 1.5

ROCKWOOL roofing boards between the thickness of 60mm to 100mm shall have the maximum clear span of = thickness of insulation board x 3



Crown and Trough Position

ROCKWOOL roofing boards must be laid with the long edge at right angles to the profiles of the metal deck. Butt joints can be made freely on the roof, if rules for cantilevering have been adhered to. If cantilevering has not been adhered to butt joints should occur at the mid-crown.



Cantilevering

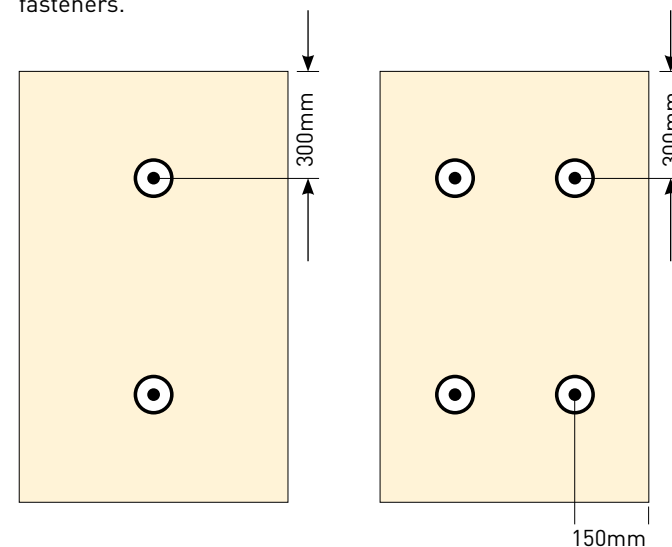
ROCKWOOL roofing boards of 60 mm or greater thickness may cantilever over a trough, provided that the maximum trough width does not exceed twice the board thickness.

For example, 80 mm thick HardRock roofing board may cantilever over a maximum through width of 160 mm.

Mechanical Fastening of Insulation

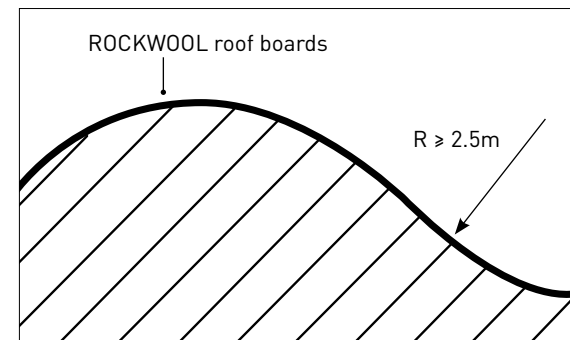
Where the roofing system is mechanically fastened, 2 fasteners per 0.72m² (1200mm x 600mm board size) is recommended for membrane roof system.

For both the field area and the edge region of flat roofs sufficient stability is achieved when using 2 fasteners. However, for the corner region of flat roofs, it is universal practice to increase the number of membrane fasteners per m², and also to reduce the distance between the rows of fasteners.



Mechanical Fastening of Insulation for Roof with Curvatures

ROCKWOOL roofing boards can be installed in curved roof with a radius as low as 2.5 m. For application at curved roofs, a minimum of 4 fasteners per board to locate and secure the boards during installation (see under 'mechanical fastening').



Additional Roof Loads

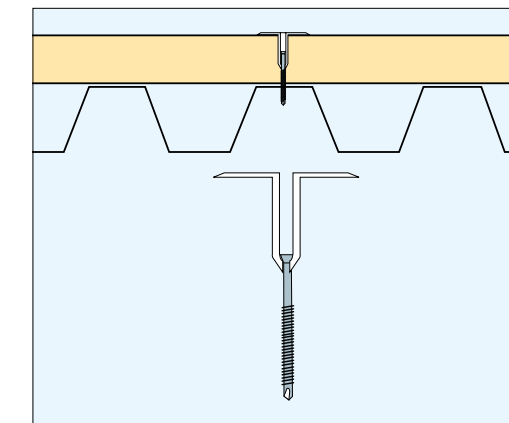
Plant and Machinery

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, ROCKWOOL Megarock roofing boards should be used and further protection to spread the load may be required.

Mechanical Fastening of Roofing Boards

For the mechanical fastening of ROCKWOOL roofing boards to metal, concrete or timber decks, ROCKWOOL recommends the use of fasteners incorporating a plastic tube washer.



Plastic Tube Fastener

Sitework

Installation

ROCKWOOL roofing boards should be laid with staggered joints wherever possible and tightly butted to avoid gaps. 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.

Water Absorption

ROCKWOOL stone wool consists of randomly oriented water-repellent fibres. Wetting will therefore only occur in proximity to its surface.

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

Installation of ROCKWOOL roofing boards during rain should be strictly avoided. Force water such as rain water will penetrate through the product and weaken the wool structure. The installation sequence shall follow the membrane installation. Any exposed insulation boards should immediately be covered with waterproof covering to avoid penetration of rain water.

Cutting Roofing Boards

ROCKWOOL roofing boards are easy to cut or shape using a sharp knife or panel saw. The boards are non-brittle and will not crumble when cut.

Protection of Roofing Boards during Installation

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

Under no circumstances should the finished roof be used as a working platform without adequate protection being provided. If an area is required to be designated as a working platform, it is recommended to install ROCKWOOL Megarock around the location.

ROCKWOOL Asia 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.

Preparation Work for Refurbishment

Unless the existing roof finish is known to be sound and watertight, all previously applied finishes and, if necessary, insulation layers should be removed. It is recommended that the designer or contractor checks existing levels to ensure that the falls are correct.

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Thermalrock® S (Slab)



General Product Information

ROCKWOOL stone wool products are made of basalt, a volcanic stone, which is the world's most abundant natural resource.

ROCKWOOL stone wool products are non-combustible with a melting point more than 1000°C. They are particularly suitable for thermal insulation, fire protection and sound reduction or absorption.

ROCKWOOL stone wool is inorganic and contains no nutritious substance. Therefore it will not be attacked by microorganisms. Stone wool will not rot and does not attract vermin.

No CFCs, HFCs, HCFCs, or asbestos are used in the manufacture of ROCKWOOL stone wool products.

Applications

Thermalrock S is manufactured in a wide variety of thicknesses and densities to suit most requirements, suitable for general application in residential, commercial and industrial buildings.

Facings

Thermalrock S products are available in plain, aluminium foil facings and one-sided or two sided glass tissue facings.

Packaging and Storage

Thermalrock S is shrink-wrapped in polyethylene sheets for ease of handling, transportation, storage and identification. Products should be stored indoors or under a waterproof covering.



Dimension

Standard sizes and densities			
Nominal Density (kg/m ³)	40 - 140		
Size : L x W (mm)*	1200 x 600		
Thickness (mm)**	50	75	100

Note: Please contact your local representatives for sizes not stated in the data sheet.

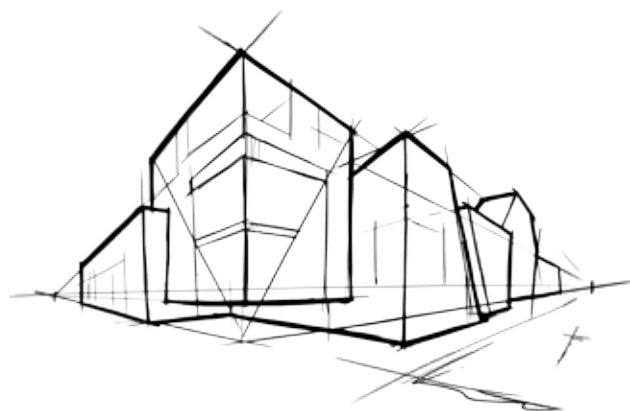


Technical Parameters

	S40	S60	S80	S100	S120	S140	Standard
Nominal Density (kg/m ³)	40	60	80	100	120	140	
Thermal Conductivity (W/mK)*	0.036	0.034	0.034	0.034	0.034	0.034	ASTM C518
Sound Absorption Coefficient (NRC) at 50mm thickness	1.00	1.05	1.05	1.05	1.05	0.90	ISO 354
Fire Performance	Non-combustible / Euro Class A1 (without facing)						EN 13501-1
Water Vapor Absorption (Moisture Resistance)	< 0.04 %, by volume						ASTM C1104/C1104M
Water Absorption (Partial Immersion)	< 0.5 kg/m ²						EN 1609

* Thermal conductivity is tested at mean temperature of 20°C in accordance with ASTM C518 by external accredited laboratory. It is recommended to have a safety factor of 20% as design value.

* For UL approved products, please contact our local representative.



Disclaimer: The information contained in this data sheet is believed to be correct at the date of publication. ROCKWOOL does not accept responsibility for the consequences of using Thermalrock S in applications different from those described above.

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