



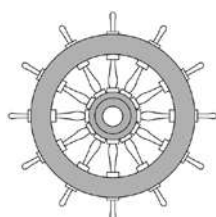
MARINE AND OFFSHORE PRODUCTS AND SOLUTIONS



PAROC®

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Photos: Paroc and ©Kari Palsila

PAROC® MARINE INSULATIONS MEET ALL REQUIREMENTS

The shipbuilding industry sets very high requirements for safety and comfort on board. Products and constructions to be used for fire protection must be tested and approved according to the rules and regulations of IMO (International Maritime Organisation).

NON-COMBUSTIBILITY

PAROC Marine insulations are manufactured from stone and the products have excellent properties as a passive guarantee of the fire safety of ships. PAROC stone wool products are capable of withstanding high temperatures.

The determination of non-combustibility in accordance with IMO FTP Code Part 1 has been performed for all PAROC Marine insulations. Continuous quality control of the products is performed by VTT (Technical Research Centre of Finland).

CONSTRUCTION APPROVALS

PAROC products have been tested in various A- and H-class deck and bulkhead constructions and in numerous fire door and panel constructions.

PAROC Marine Insulations meet the requirements of their users in the following areas:

- **Fire protection of constructions and components**
- **Heating economy of ships and comfort of their passengers, heat and cold insulations**
- **Good acoustic properties of constructions and devices**
- **Insulation materials used as surface materials are functional and easy to clean**
- **Meeting the requirements of Classification Institutes and National Marine Authorities in accordance with the rules and regulations of IMO and the Marine Equipment Directive (modules B and D).**



FIRE INSULATION PRODUCTS

Fire insulation on ships must meet very high requirements. Paroc has tested several A-class constructions for aluminium and steel decks and bulkheads. Products are PAROC Marine Wired Mats and PAROC Marine Fire Slabs, both with and without facings.

Plain insulation is used in facilities where it lies behind other constructions or in rooms, where it must be protected by steel sheets (i.e. against mechanical stress).

A functional insulation solution for car decks and engine rooms can be achieved using pre-coated slabs and preformed insulations. Coated products ensure a clean and easily maintained final surface. The range of facings includes glass fibre cloths 50–400 g/m² and aluminium foils.

The quick and easy installation of coated fire insulation ensures considerable cost savings. Coated products also enable using more lightweight overall solutions than before. For the user this means more quiet and comfortable working facilities.



PAROC Marine Navis Slab 60

- decks and bulkheads in steel constructions
- Air-conditioning devices and ducts
- Products with facing especially for car decks, engine rooms and air-conditioning machine rooms



PAROC Marine Navis Mat 60

- Decks and bulkheads in steel constructions
- PAROC Marine Navis Mat 60 is also available with AluCoat facing



PAROC Marine Navis Wired Mat 60

- Decks and bulkheads in steel constructions
- PAROC Marine Navis Wired Mat 60 is also available with AluCoat facings and glass fibre cloths

PAROC Marine Fire Slab 100

- Decks and bulkheads in steel and aluminium constructions
- Fire doors
- Wall cassettes
- Air-conditioning devices and ducts
- Products with facing especially for car decks, engine rooms and air-conditioning machine rooms

PAROC Marine Navis Mat 90

- Decks and bulkheads in aluminium constructions
- PAROC Marine Navis Mat 90 is also available with AluCoat facing

PAROC Marine Navis Wired Mat 90

- Decks and bulkheads in aluminium constructions
- PAROC Marine Navis Mat 90 is also available with AluCoat facing and glass fibre cloths

PAROC Marine Wired Mat 100

- Decks and bulkheads in steel and aluminium constructions
- Circular ducts
- Products with facing above suspended ceilings and in maintenance facilities

The product is also available without the net.

THERMAL INSULATION PRODUCTS

Thermal insulation together with fire and sound insulation create the basis for comfort on board. By choosing the right thermal insulation solutions, the optimum indoor climate temperature and energy savings can be achieved. In addition, the excellent acoustic properties of PAROC stone wool can be utilized.

In shipbuilding plain thermal insulation is used in facilities where it lies behind other constructions. Coated slabs and mats are used as thermal insulation above suspended ceilings and in facilities where they remain visible. The range of facings includes several alternatives from aluminium foil to glass fibre cloths.



PAROC Marine Wired Mat 30

- Decks, bulkheads and outer bulkheads
- Products with facing above suspended ceilings and in facilities where they remain visible
- Machinery and devices with temperature $\leq 200^{\circ}$
- Only available with AluCoat, G4 and G7 facings



PAROC Marine Mat 30 AluCoat

- Thermal and condensation insulation of ducts and devices



PAROC Marine Slab 30, 40, 60

- Various applications
- Devices and tanks with flat surfaces
- Sound insulation above suspended ceilings
- With aluminium foil as condensation insulation and in applications where thick insulation is required
- Products with facing in facilities where they remain visible
- Machinery and devices



PAROC Marine Wired Mat 40

- Decks, bulkheads and outer bulkheads
- Products with facing above suspended ceilings and in facilities where they remain visible
- Machinery and devices with temperature $\leq 200^{\circ}$

INSULATIONS FOR AIR DUCTS AND PIPES

PAROC products ensure the comfort, safety and economic efficiency of duct and pipe insulations on board. Several facing options, fit to size pipe sections and a wide range of mats enable easy and fast installation and prepare the way for the optimum end solution.

PAROC Marine Wired Mats are made of stone wool and are used as thermal insulation for smoke ducts and chimneys on ships. If required, the wire net can also be made of stainless steel with a higher temperature resistance than galvanized wire netting. Depending on the application of the PAROC Section, it can also be produced with aluminium foil or glass fibre cloth.

Thermal and condensation insulations for air-conditioning devices are coated with aluminium foil reinforced with glass fibre. These products are ideal for the insulation of rectangular and round ducts.



PAROC Hvac Section AluCoat T PAROC Hvac Combi AluCoat T

- Thermal and condensation insulation of pipes and ducts
- Tape in the longitudinal seam
- Surface temperature of the facing must not exceed 80 °C



PAROC Pro Section 100

- Steam pipes
- Heating pipes
- Fuel oil pipes
- Exhaust gas pipes
- Sprinkler pipes
- Deck pipes
- Sewage pipes
- Maximum service temperature 640 °C.
- The product can also be manufactured with a density of 140 kg/m³ (PAROC Pro Section 140).



PAROC Pro Section 100 G4

- Thermal and condensation insulation of pipes and ducts
- For applications requiring excellent durability from the facing e.g. on car decks, engine rooms and passages.
- The product can also be manufactured with aluminium foil on top (facing G7). The overlapping of these facings can be heat sealed.



PAROC Marine Wired Mat 100 and PAROC Marine Wired Mat 100 AluCoat

- Smoke ducts and chimneys
- Exhaust gas dampers
- Large pipe elbows
- Penetrations of air ducts



PAROC Pro Lamella Mat AluCoat

- Thermal and condensation insulation of ducts
- For applications where higher compressive strength is required



PAROC Marine Mat 30 AluCoat

- Thermal and condensation insulation of ducts and devices

SPECIAL INSULATION SOLUTIONS

Many kinds of prefabricated products, for example insulations for cabins, panels, fire doors and ventilation machinery are used in the shipbuilding industry. Manufacturers of these products often require customer-specified and tailored solutions.

The purpose of PAROC Marine insulations is to offer a solution for every part of the ship where some kind of insulation is needed.

Our range of products also covers the insulating materials needed by subcontractors within shipbuilding.



PAROC Marine Slabs

- Wall panels and cassettes
- Suspended ceiling panels
- Floating floors
- As lamellas in wall and floor panels
- Fire doors

PAROC Marine Slab 220 And PAROC Marine Slab 250

- Ship cabin constructions and cassettes
- Sound reduction panels
- Draught barriers
- Doors, wall and ceiling panels

Products:

- PAROC Marine Slab 130
- PAROC Marine Floor Slab 140
- PAROC Marine Fire Slab 150
- PAROC Marine Slab 160
- PAROC Marine Slab 180



PAROC MARINE FACINGS

AluCoat Reinforced aluminium foil facing, 62–80 g/m²

AluCoat T Reinforced aluminium foil facing with tape on the longitudinal seam, available only on pipe sections, 62–80 g/m²

G1 White glass fibre facing, ~210 g/m²

G2 Black glass fibre facing, ~200 g/m²

G3 White glass fibre facing, ~430 g/m²

G4 White glass fibre facing with aluminium below, ~250 g/m²

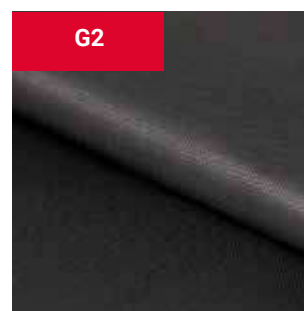
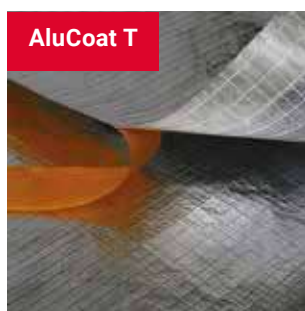
G7 White glass fibre facing with aluminium on top, ~250 g/m²

N1 Grey non-woven tissue, ~50 g/m²

N3 Black non-woven tissue, ~60 g/m²

N5 Grey non-woven tissue, ~60 g/m²

N8 Grey non-woven tissue, ~125 g/m².



TECHNICAL DATA

Stone Wool Mats

Product	Nominal density kg/m ³	Compressive stress (10% deformation) kPa	Thermal conductivity (W/mK) Mean temperature ³⁾				
			10°C	50°C	100°C	200°C	300°C
PAROC Marine Wired Mat 30	30		0.037				
PAROC Marine Wired Mat 40	40		0.036				
PAROC Marine Wired Mat 80	80		0.036	0.040	0.046	0.064	0.089
PAROC Marine Navis Mat 60	60		0.032	0.038	0.045	0.063	0.086
PAROC Marine Navis Mat 90	90		0.039	0.042	0.047	0.063	0.083
PAROC Marine Navis Wired Mat 60	60		0.032	0.038	0.045	0.063	0.086
PAROC Marine Navis Wired Mat 90	90		0.039	0.042	0.047	0.063	0.083
PAROC Marine Wired Mat 100	100		0.039	0.042	0.047	0.063	0.083
PAROC Pro Lamella Mat AluCoat	50		0.039	0.045	0.055	0.081	
PAROC Marine Mat 30	30		0.036				
PAROC Marine Mat 30 AluCoat	30		0.036				
PAROC Marine Mat 35	35		0.036				
PAROC Marine Mat 35 AluCoat	35		0.036				

Stone Wool Slabs

Product	Nominal density kg/m ³	Compressive stress (10% deformation) kPa	Thermal conductivity (W/mK) Mean temperature ³⁾							
			10°C	50°C	100°C	200°C	300°C	400°C	500°C	600°C
PAROC Marine Slab 30	30		0.039	0.042	0.054	0.085	0.132			
PAROC Marine Slab 40	40	1	0.037	0.042	0.054	0.085				
PAROC Marine Slab 60	60	3	0.037	0.042	0.048	0.067				
PAROC Marine Navis Slab 60	60	5	0.032	0.038	0.045	0.063	0.086	0.116	0.153	
PAROC Marine Navis Slab 100	100	10		0.043	0.047	0.065	0.095	0.138	0.196	
PAROC Marine Slab 80	80	10	0.037	0.043	0.047	0.065	0.095	0.138	0.196	
PAROC Marine Fire Slab 80	80	10	0.037	0.043	0.047	0.065	0.095	0.138	0.196	
PAROC Marine Fire Slab 100	100	10	0.037	0.043	0.047	0.065	0.095	0.138	0.196	
PAROC Marine Slab 130	130	20		0.042	0.046	0.060	0.081	0.110	0.147	0.192
PAROC Marine Fire Slab 150	150	20		0.042	0.046	0.060	0.081	0.110	0.147	0.192
PAROC Marine Slab 160	160	40	0.039	0.042	0.046	0.060	0.081	0.110	0.147	0.192
PAROC Marine Slab 180	180	50	0.039	0.042	0.046	0.060	0.081	0.110	0.147	0.192
PAROC Marine Slab 220	220	60		0.047	0.050	0.058	0.071	0.087	0.107	0.131
PAROC Marine Slab 250	250	80		0.047	0.050	0.058	0.071	0.087	0.107	0.131

Stone Wool Pipe Sections

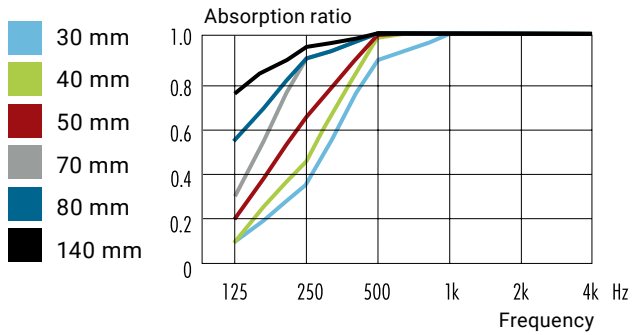
Product	Thermal conductivity (W/mK) Mean temperature ³⁾						
	10°C	50°C	100°C	150°C	200°C	300°C	400°C
PAROC Hvac Section AluCoat T	0.034	0.037	0.044	0.053	0.063	---	
PAROC Pro Section 100		0.040	0.046		0.064	0.092	
PAROC Pro Section 140		0.042	0.047		0.065	0.087	0.115

See product data sheets for dimensions and other information.

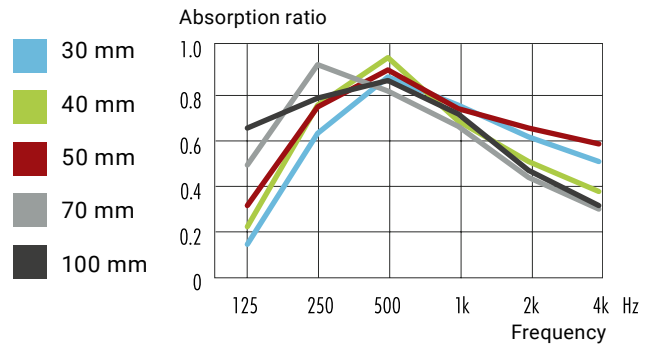
SOUND ABSORPTION*

Values tested in accredited testing laboratories according to EN ISO 354:2003 and EN ISO 11654:1997.

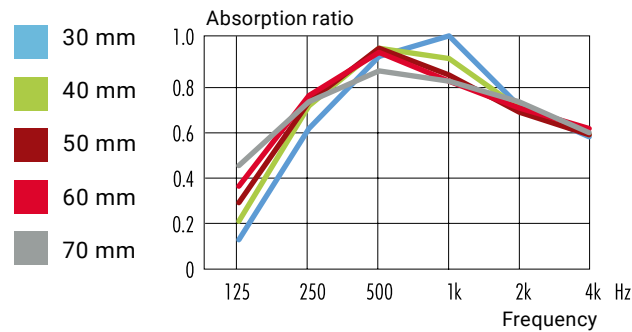
PAROC Marine Navis Slab 60



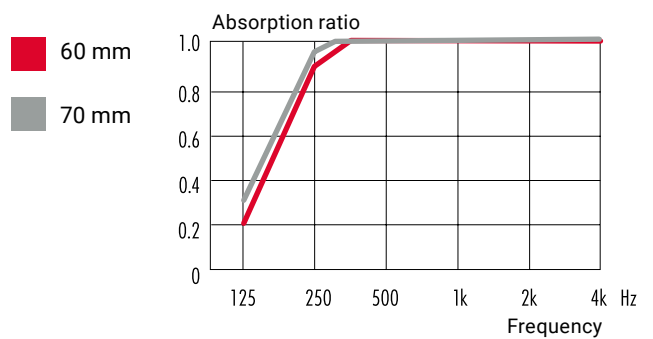
PAROC Marine Navis Slab 60 G1



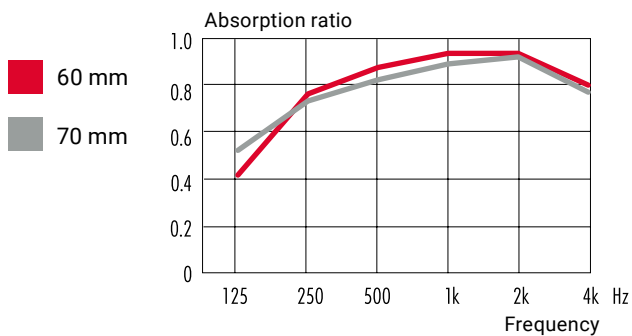
PAROC Marine Navis Wired Mat 60 G1



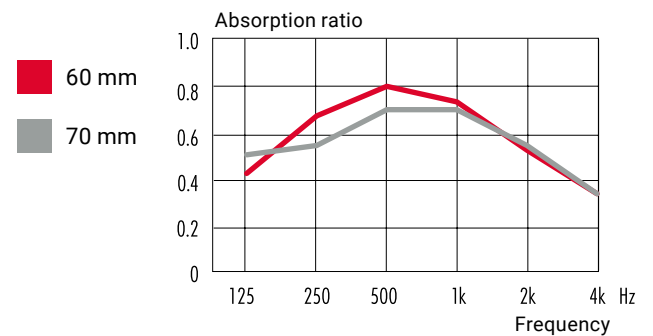
PAROC Marine Navis Wired Mat 90



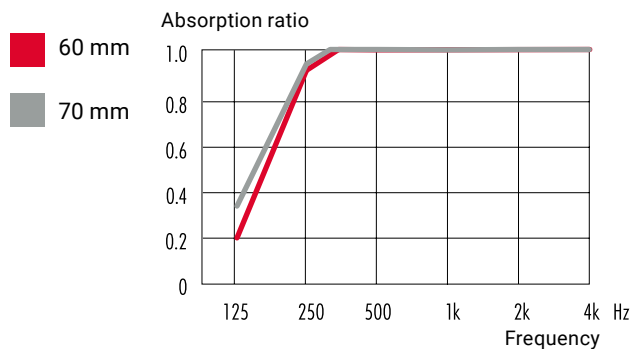
PAROC Marine Navis Wired Mat 90 AluCoat



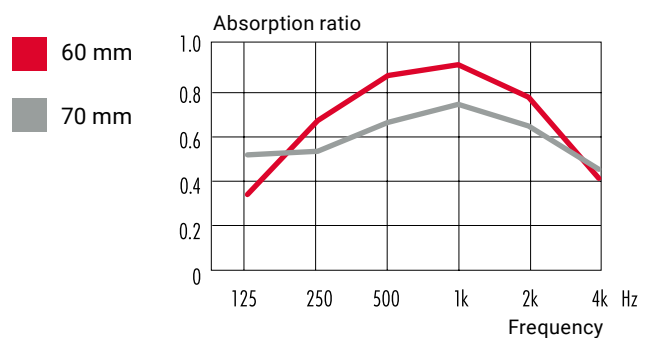
PAROC Marine Navis Wired Mat 90 G7



PAROC Marine Navis Mat 90



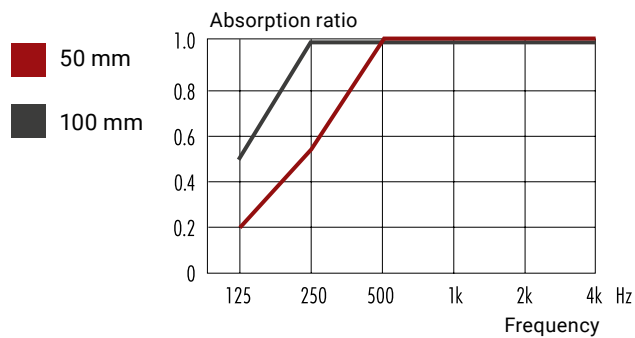
PAROC Marine Navis Mat 90 AluCoat



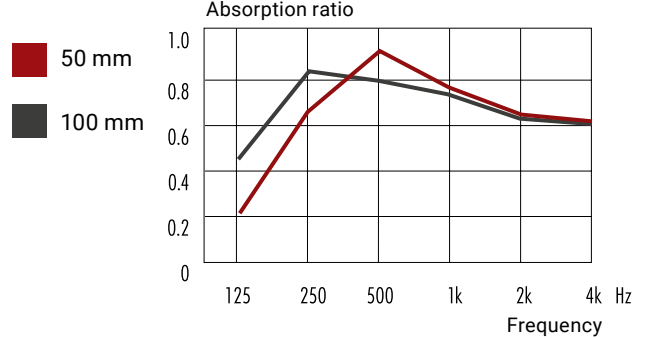
* The following sound attenuation measurements are done by certified Laboratories.

Values tested in accredited testing laboratories according to EN ISO 354:2003 and EN ISO 11654:1997.

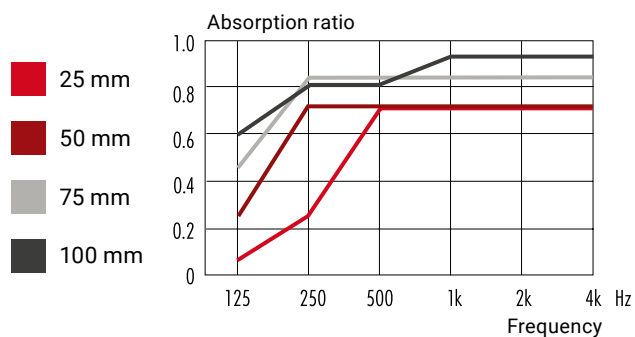
PAROC Marine Slab 40



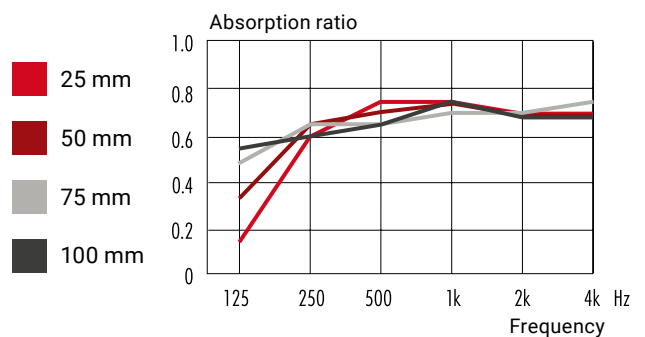
PAROC Marine Slab 40 G3



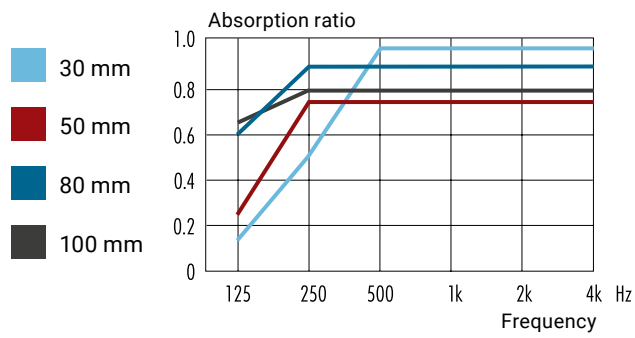
PAROC Marine Fire Slab 100



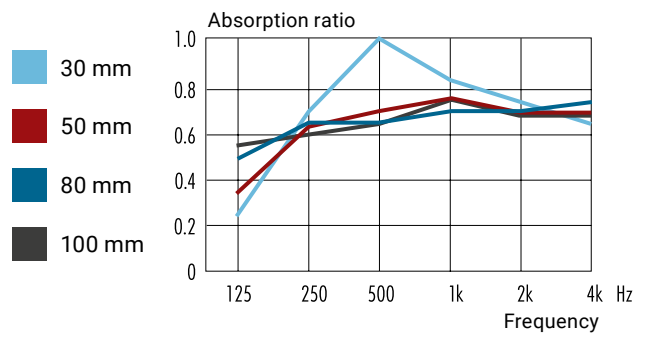
PAROC Marine Fire Slab 100 G1**



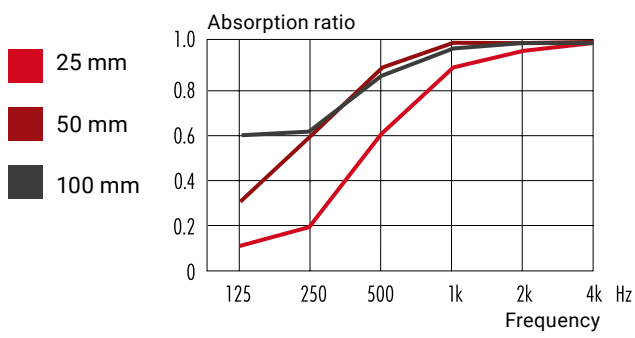
PAROC Marine Wired Mat 100



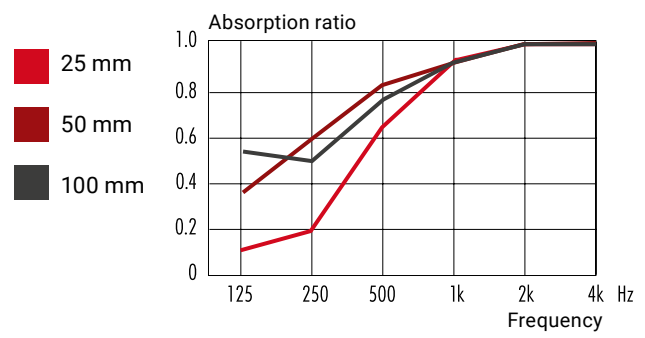
PAROC Marine Wired Mat 100 G1



PAROC Marine Slab 130



PAROC Marine Slab 160

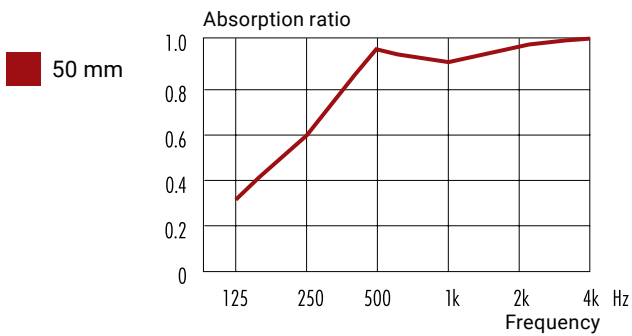


* The following sound attenuation measurements are done by certified Laboratories.

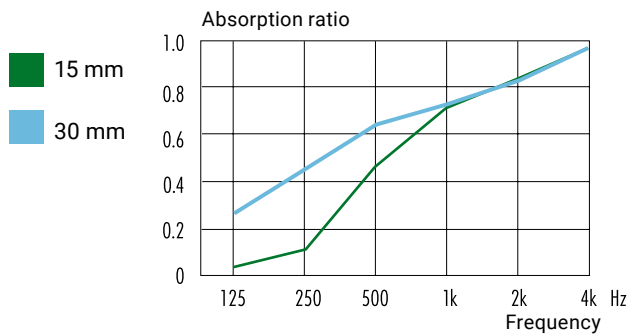
** Estimated values based on existing results.

Values tested in accredited testing laboratories according to EN ISO 354:2003 and EN ISO 11654:1997.

PAROC Marine Floor Slab 140



PAROC Marine Slab 220



Product	Weighted absorption α_w	Absorption class
PAROC Marine Navis Slab 60, 30 mm	0.65 (MH)	C
PAROC Marine Navis Slab 60, 40 mm	0.75 (MH)	C
PAROC Marine Navis Slab 60, 50 mm	0.95	A
PAROC Marine Navis Slab 60, 60 mm	1.00	A
PAROC Marine Navis Slab 60, 70 mm	1.00	A
PAROC Marine Navis Slab 60, 80 mm	1.00	A
PAROC Marine Navis Slab 60, 140 mm	1.00	A
PAROC Marine Navis Slab 60 AluCoat, 50 mm	0.75	C
PAROC Marine Navis Slab 60 G1, 30 mm	0.65	C
PAROC Marine Navis Slab 60 G1, 40mm	0,55(LM)	D
PAROC Marine Navis Slab 60 G1, 50 mm	0,7	C
PAROC Marine Navis Slab 60 G1, 60 mm	0,55(LM)	D
PAROC Marine Navis Slab 60 G1, 70mm	0,45(LM)	D
PAROC Marine Navis Slab 60 G1, 100mm	0,50(LM)	D
PAROC Marine Navis Slab 60 G3, 50 mm	0,95	A
PAROC Marine Navis Slab 60 G4, 50 mm	0,30(LM)	D
PAROC Marine Navis Slab 60 G7, 50 mm	0,30(LM)	D
PAROC Marine Navis Wired Mat 60, 50 mm	0,80(H)	B
PAROC Marine Navis Wired Mat 60 AluCoat, 50 mm	0,85	B
PAROC Marine Navis Wired Mat 60 G1, 30 mm	0,75(M)	C
PAROC Marine Navis Wired Mat 60 G1, 40 mm	0,75	C
PAROC Marine Navis Wired Mat 60 G1, 50 mm	0,75	C
PAROC Marine Navis Wired Mat 60 G1, 60 mm	0,75	C
PAROC Marine Navis Wired Mat 60 G1, 70 mm	0,75	C
PAROC Marine Navis Wired Mat 60 G4, 50 mm	0,50(LM)	D
PAROC Marine Navis Wired Mat 60 G7, 50 mm	0,50(LM)	D
PAROC Marine Navis Wired Mat 90 G4, 60 mm	0,55(LM)	D
PAROC Marine Navis Wired Mat 90 G4, 70 mm	0,55	D
PAROC Marine Navis Wired Mat 90 G7, 60 mm	0,55(LM)	D
PAROC Marine Navis Wired Mat 90 G7, 70 mm	0,55	D
PAROC Marine Navis Wired Mat 90, 60 mm	1	A
PAROC Marine Navis Wired Mat 90, 70 mm	1	A
PAROC Marine Navis Wired Mat 90 AluCoat, 60 mm	0,9	A
PAROC Marine Navis Wired Mat 90 AluCoat, 70 mm	0,9	A
PAROC Marine Navis Wired Mat 90 G1, 60 mm	0,65(L)	C
PAROC Marine Navis Wired Mat 90 G1, 70 mm	0,7	C

Product	Weighted absorption α_w	Absorption class
PAROC Marine Navis Mat 60, 60 mm	1	A
PAROC Marine Navis Mat 90, 60 mm	1	A
PAROC Marine Navis Mat 90, 70 mm	1	A
PAROC Marine Navis Mat 90 AluCoat, 60 mm	0,65(LM)	C
PAROC Marine Navis Mat 90 AluCoat, 70 mm	0,65	C
PAROC Marine Fire Slab 100, 25 mm	0.55	D
PAROC Marine Fire Slab 100, 50 mm	1.00	A
PAROC Marine Fire Slab 100, 75 mm	1.00	A
PAROC Marine Fire Slab 100, 100 mm	1.00	A
PAROC Marine Fire Slab 100 G1, 25 mm	0.75	C
PAROC Marine Fire Slab 100 G1, 50 mm	0.75	C
PAROC Marine Fire Slab 100 G1, 75 mm	0.70	C
PAROC Marine Fire Slab 100 G1, 100 mm	0.70	C
PAROC Marine Slab 40, 50 mm	0.85 (H)	B
PAROC Marine Slab 40, 100 mm	1.00	A
PAROC Marine Slab 40 G3, 50 mm	0.70 (L)	C
PAROC Marine Slab 40 G3, 100 mm	0.70 (L)	C
PAROC Marine Slab 130, 25 mm	0.50 (HH)	D
PAROC Marine Slab 130, 50 mm	0.85 (H)	B
PAROC Marine Slab 130, 100 mm	0.85 (H)	B
PAROC Marine Slab 160, 25 mm	0.50 (MH)	D
PAROC Marine Slab 160, 50 mm	0.85 (H)	B
PAROC Marine Slab 160, 100 mm	0.80 (H)	B
PAROC Marine Floor Slab 140, 50 mm	0.90 (H)	A
PAROC Marine Slab 220, 15 mm	0.90 (MH)	D
PAROC Marine Slab 220, 30 mm	0.70 (H)	C
PAROC Marine Wired Mat 100, 30 mm	0.80 (H)	B
PAROC Marine Wired Mat 100, 50 mm	1.00	A
PAROC Marine Wired Mat 100, 80 mm	1.00	A
PAROC Marine Wired Mat 100, 100 mm	1.00	A
PAROC Marine Wired Mat 100 G1, 30 mm	0.80	B
PAROC Marine Wired Mat 100 G1, 50 mm	0.75	C
PAROC Marine Wired Mat 100 G1, 80 mm	0.70	C
PAROC Marine Wired Mat 100 G1, 100 mm	0.70	C

The letters connected to the weighted absorption value (L, M, H) are spectrum indicators according to ISO 11654 where L = Low frequency, M = Middle frequency, and H = High frequency.

PAROC LIGHT MARINE FIRE PROTECTION SOLUTIONS

PAROC Light Marine are new lightweight solutions for fire insulated decks and bulkheads, suited for weight critical projects. Read more about PAROC Light Marine solutions on www.paroc.com/lightmarine.



BENEFITS

- Financial benefits
- Lower operating costs
- Reduced weight
- Increased speed
- Lower fuel consumption
- Decrease in emissions

LIGHT MARINE A-CLASS STEEL DECKS AND BULKHEADS

Paroc's lightweight solutions for A-class steel decks and bulkheads can be done with one product or combining slabs and mats. The density and the thickness is always the same, no matter which products are used. The new solutions are easiest to design and install on market.

MULTIPLE COMBINATIONS

All below mentioned products are approved for A-class steel decks and bulkheads. Products can be used in different combinations, also combining slabs and mats in same application.

- **PAROC Marine Navis Slab 60** (can be covered with facings: AluCoat, G1, G2, G3, G4, G7 and LF1)
- **PAROC Marine Navis Mat 60** (facings: AluCoat)
- **PAROC Marine Navis Wired Mat 60** (facings: AluCoat, G1, G2, G4, G7 and LF1)

Class	Nominal density kg/m ³	level / stiffener		Sound reduction R _w (C, Ctr), dB
		Insulating thickness mm	Weight kg/m ²	
Steel Decks - Navis Slabs or Mats				
A60	60	50/30	3,0/1,8	47 (-1, -6)
A30	60	30/30	1,8/1,8	46 (-2, -6)
A15	60	30/0 (no installation stiffeners)	1,8/0	45 (-1, -5)
Steel Bulkheads - Navis Slabs or Mats				
A60	60	60/30	3,6/1,8	47 (-1, -6)
A30	60	40/30	2,4/1,8	47 (-2, -6)
A15	60	30/0 (no installation stiffeners)	1,8/0	45 (-1, -5)
Floating Floor - PAROC Marine Floor Slab 140				
A60	140	50 (no steel plates on top)	7,0	45 (-2, -7)
A60	140	50 (3,0 mm steel plates on top)	7,0	52 (-3, -8)

ONLY ONE DENSITY - SEVERAL INSTALLATION POSSIBILITIES

Mats and slabs can be used in the same installation in various combinations. The density and the thickness is always the same, no matter which products are used. Below are just a few examples.

Mat on stiffeners, slabs between stiffeners



ADVANTAGES LIGHT MARINE A-CLASS STEEL SOLUTIONS

- Up to 40% weight reduction
- Only 1 density - several installation possibilities
- Easy design
- Efficient logistics
- Always the same thickness on stiffeners
- Flexible installation

Slab installation



Wired mat installation



Alternative stiffener installation



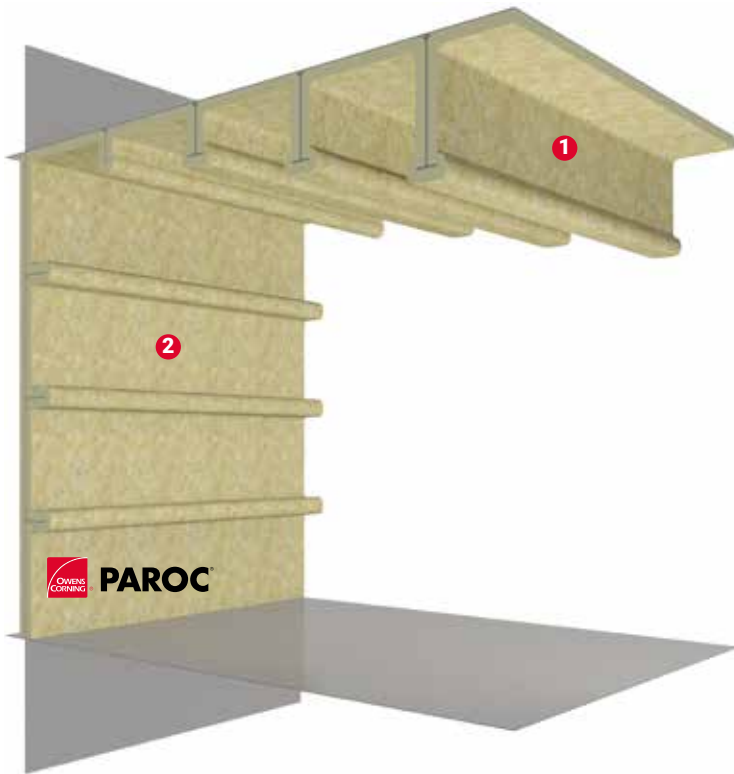
Continuous wired mat installation



A15 installation



LIGHT MARINE A60 ALUMINIUM DECKS AND BULKHEADS



ADVANTAGES LIGHT MARINE A60 ALUMINIUM SOLUTIONS

- 40 % lighter solutions
- Solutions for 4 mm and 6 mm aluminium constructions
- Also for restricted bulkheads
- Easy design
- Efficient logistics
- Flexible installation

Notice!

PAROC Marine Navis Mats can be covered with aluminium foil.

PAROC Marine Navis Wired Mats can be covered with aluminium foil or with black or white glass fiber clothing.

Maximum distance between the pins is 300 mm.

Class	Product	Nominal density kg/m ³	Insulating thickness, mm	Weight kg/m ²
Solutions for 6 mm Aluminium Constructions:				
1	A60 Aluminium Deck	PAROC Marine Navis Mat 60	60	3,6
	A60 Aluminium Bulkhead	PAROC Marine Navis Mat 60	60 on both sides	3,6 + 3,6
	A60 Aluminium Bulkhead restricted	PAROC Marine Navis Mat 60	60	3,6
Solutions for 4 mm Aluminium Constructions:				
2	A60 Aluminium Deck	PAROC Marine Navis Mat 90	60	5,4
	A60 Aluminium Bulkhead	PAROC Marine Navis Mat 90	70 on both sides	6,3 + 6,3

ONLY ONE DENSITY, ONE THICKNESS AND ONE INSULATION LAYER NEEDED

Paroc lightweight solutions for 6 mm thick A60 aluminium constructions are based on only product PAROC Marine Navis Mat 60. Insulating thickness on both decks and stiffeners is 60 mm which makes the design less complex. The installation work is easier with a lighter product and only one insulation layer is needed for all constructions. This solution is available also for restricted bulkheads.



A60 Aluminium Deck

Insulating thickness on level and on stiffener (mm)	60
Weight kg/m ²	3,6



A60 Aluminium Bulkhead

Insulating thickness on level and on stiffener (mm)	60
Weight kg/m ²	3,6 + 3,6

A60 Aluminium Bulkhead Restricted

Insulating thickness on level and on stiffener (mm)	60
Weight kg/m ²	3,6

A60 ALUMINIUM SOLUTIONS FOR 4 MM ALUMINIUM CONSTRUCTIONS

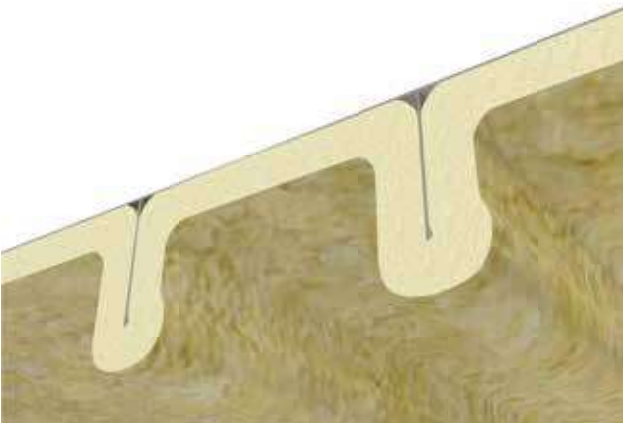
Paroc lightweight solutions for 4 mm thick A60 aluminium constructions are based on only one product PAROC Marine Navis Mat 90 in two thicknesses; 60 mm on decks and 70 mm on bulkheads.

A60 Aluminium Deck

Insulating thickness on level and on stiffener (mm)	60
Weight kg/m ²	5,4

A60 Aluminium Bulkhead

Insulating thickness on level and on stiffener (mm)	70 on both sides
Weight kg/m ²	6,3 + 6,3



LIGHT MARINE B15 EXTENDED WALL

The new 40% lighter solution for B15 wall extension is easy and flexible to make. Duct and pipe penetrations are included in the solution.

EASY DESIGN

The new lightweight wall extension solution has more variety and flexibility in design and installation. Either fire springs or pins and washers are used for fixing. Product used for the solution, PAROC Marine Navis Slab 100 AluCoat is rigid enough to make a perfect wall extension without support structures.

PENETRATIONS INCLUDED

Penetrations can be carried out easily because the product used in the extension is only 30 mm thick. Penetrations are insulated on one side of the wall with a 250 mm-long piece of PAROC Marine Navis Wired Mat 60 AluCoat, 40 mm.

Several different types of pipe and duct penetrations as well as steel cable ladder can be used in the solution. Pipes approved for penetration are copper, stainless steel and PVC-C pipes. Circular ducts of thickness 0,6 mm with outer diameter 80–160 mm and rectangular ducts in size 100x200 mm to 250x480 mm are approved for the penetrations. Pipe and duct penetration details available on www.paroc.com/lightmarine

Installation video available on www.paroc.com/lightmarine



BENEFITS

- **More variety and flexibility for making B15 wall extension**
- **Fix with fire springs or pins and washers**
- **Solutions with pipe and duct penetration included**
- **Maximum height of the wall extension even up to 2,2 m**
- **No support structures needed**
- **Only one product PAROC Marine Navis Slab 100 AluCoat needed for the wall extension**
- **Only one product PAROC Marine Navis Wired Mat 60 needed for penetration**
- **No additional sealing is required for the penetrations when insulation is cut correctly with no gaps around penetrations.**
- **Steel profile can be fixed directly on the deck or on the insulated deck**

A-CLASS STEEL DECKS AND BULKHEADS

FIRE PROTECTION SOLUTIONS WITH SLABS AND MATS



Notice!

PAROC Marine Fire Slabs can be covered with aluminium foil or with black or white glass fibre facing.

Notice!

Only rule for pinning is that the maximum distance between the pins is 300 mm.

Notice!

PAROC Marine Fire Slab 100 can be replaced with PAROC Marine Wired Mat 100 or PAROC Marine Mat 100. Please note that minimum thickness of mat products is 30 mm.

Class	Product	Nominal density kg/m ³	Insulating thickness level/stiffener, mm*	Sound reduction R _w (C, Ctr), dB
Steel Decks:				
1	A60 PAROC Marine Fire Slab 100	100	40/25	47 (-2, -6)
	A30 PAROC Marine Fire Slab 100	100	25/25	45 (-1, -4)
	A15 PAROC Marine Fire Slab 80	80	40/0	45 (-1, -4)
Steel Bulkheads:				
2	A60 PAROC Marine Fire Slab 100	100	60/25	49 (-1, -6)
	A30 PAROC Marine Fire Slab 100	100	40/25	47 (-2, -6)
	A15 PAROC Marine Fire Slab 80	80	40/0	45 (-1, -4)
Floating Floor:				
3	A60 PAROC Marine Floor Slab 140	140	50 (no steel plates on top)	45 (-2, -7)
	A60 PAROC Marine Floor Slab 140	140	50 (3,0 mm steel plates on top)	52 (-3, -8)
	A60 PAROC Marine Slab 220	220	25+25 (no steel plates on top)	44 (-1, -5)
	A60 PAROC Marine Slab 220	220	25+25 (3,0 mm steel plates on top)	52 (-2, -7)

* Please check validity of the certification from Paroc sales.

Steel Decks A60, A30 and A15



Example of A60 class solution for steel deck with PAROC Marine Fire Slab 100 G1 and preformed block PAROC Marine Fire Slab 100 G1, HPL. Insulating thickness on deck is 40 mm and on stiffener 25 mm.



Example of A30 class solution for steel deck with PAROC Marine Fire Slab 100 G1 and preformed block PAROC Marine Fire Slab 100 G1, HPL. Insulating thickness on deck and stiffener is 25 mm.

Steel Bulkheads A60, A30 And A15



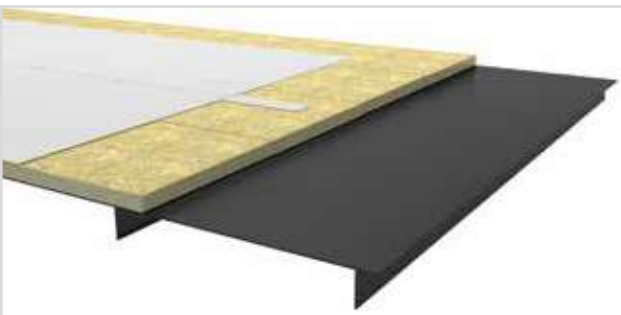
Example of A60 class solution for steel bulkhead with PAROC Marine Fire Slab 100. Insulating thickness on bulkhead is 60 mm and on stiffener 25 mm.

PAROC Marine Fire Slab 100, 25 mm on the stiffeners can be replaced by PAROC Marine Wired Mat 100, 30 mm.



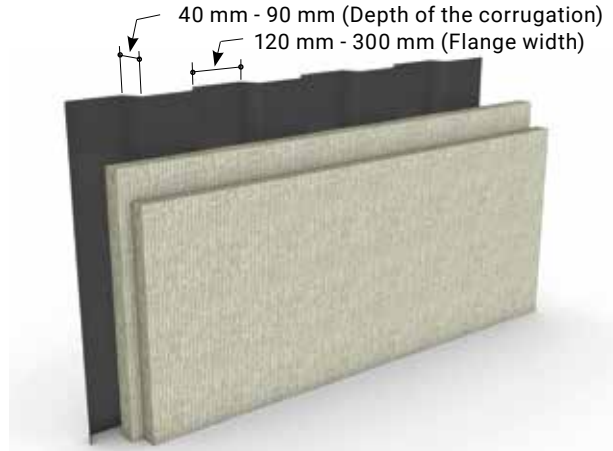
Example of A30 class solution for steel bulkhead with PAROC Marine Fire Slab 100. Insulating thickness on bulkhead is 40 mm and on stiffener 25 mm.

Floating Floor



Example of A60 floating floor solution for steel deck with PAROC Marine Floor Slab 140, thickness min 50 mm or PAROC Marine Slab 220 thickness 25+25 mm. Slabs are covered by one layer of min. 3 mm steel sheets spot welded or screwed together (pitch max 300 mm) by means of min. 1,5 mm thick steel flats having width of min. 100 mm.

Steel Bulkhead A60 Corrugated



Example of A60 solution for corrugated steel bulkhead with PAROC Marine Fire Slab 100, thickness 40+40 mm.

- Thickness of the corrugated steel is minimum 2 mm.
- Depth of corrugation can be varied from 40 mm to 90 mm.
- Flange width from 120 mm to 300 mm.
- Pins are fastened to the top flange of the corrugation.
- Maximum distance to the nearest pin is 300 mm.

H-CLASS STEEL DECKS AND BULKHEADS

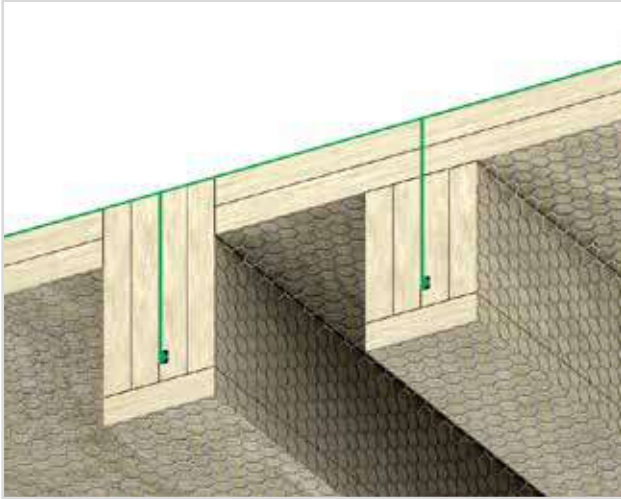


Notice!

PAROC Marine Fire Slab 100 can be covered with aluminium foil or with black or white glass fibre clothing.

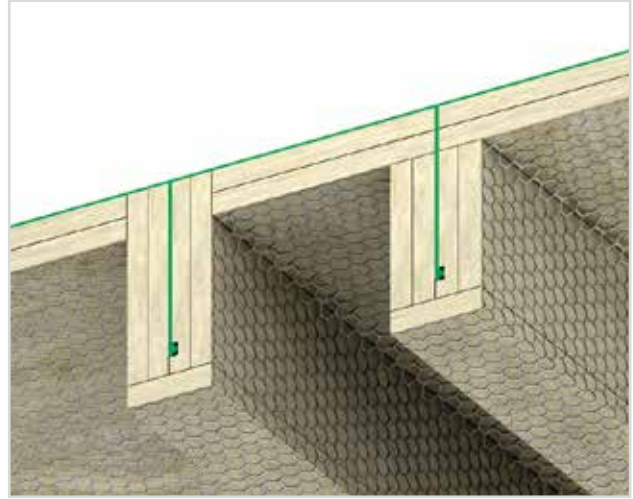
Class	Product	Nominal density kg/m ³	Insulating thickness level/stiffener, mm
Steel Decks:			
H120	PAROC Marine Fire Slab 100	100	60 + 60/60 + 60
H60	PAROC Marine Fire Slab 100	100	45 + 45/45 + 45
Steel Bulkheads:			
H120, restricted, fire against insulated side	PAROC Marine Fire Slab 100	100	60 + 60/60 + 60
H60, restricted, fire against insulated side	PAROC Marine Fire Slab 100	100	50 + 50/50 + 50

Steel Deck H120



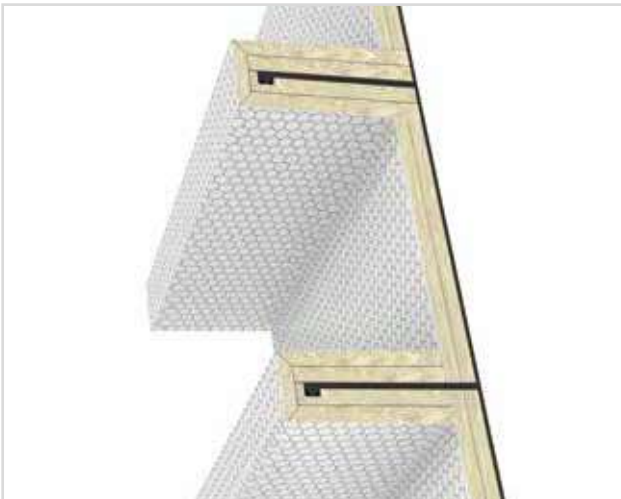
Example of H120 class solution for steel decks with PAROC Marine Fire Slab 100, insulating thickness on deck and stiffener is 60 + 60 mm.

Steel Deck H60



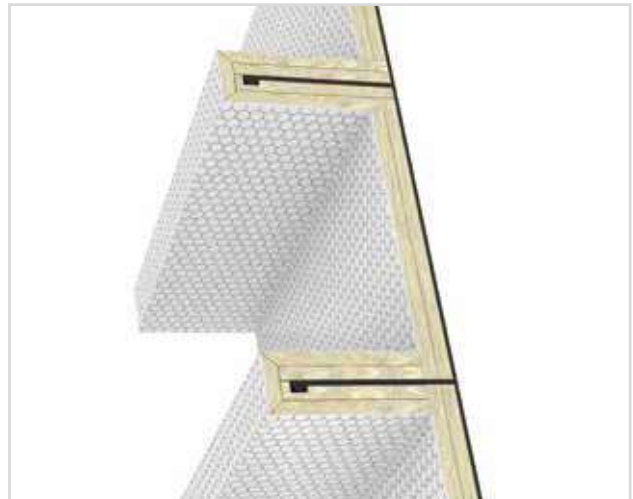
Example of H60 class solution for steel decks with PAROC Marine Fire Slab 100, insulating thickness on deck and stiffener is 45 + 45 mm.

Steel Bulkhead H120, Restricted, Fire Against Insulated Side



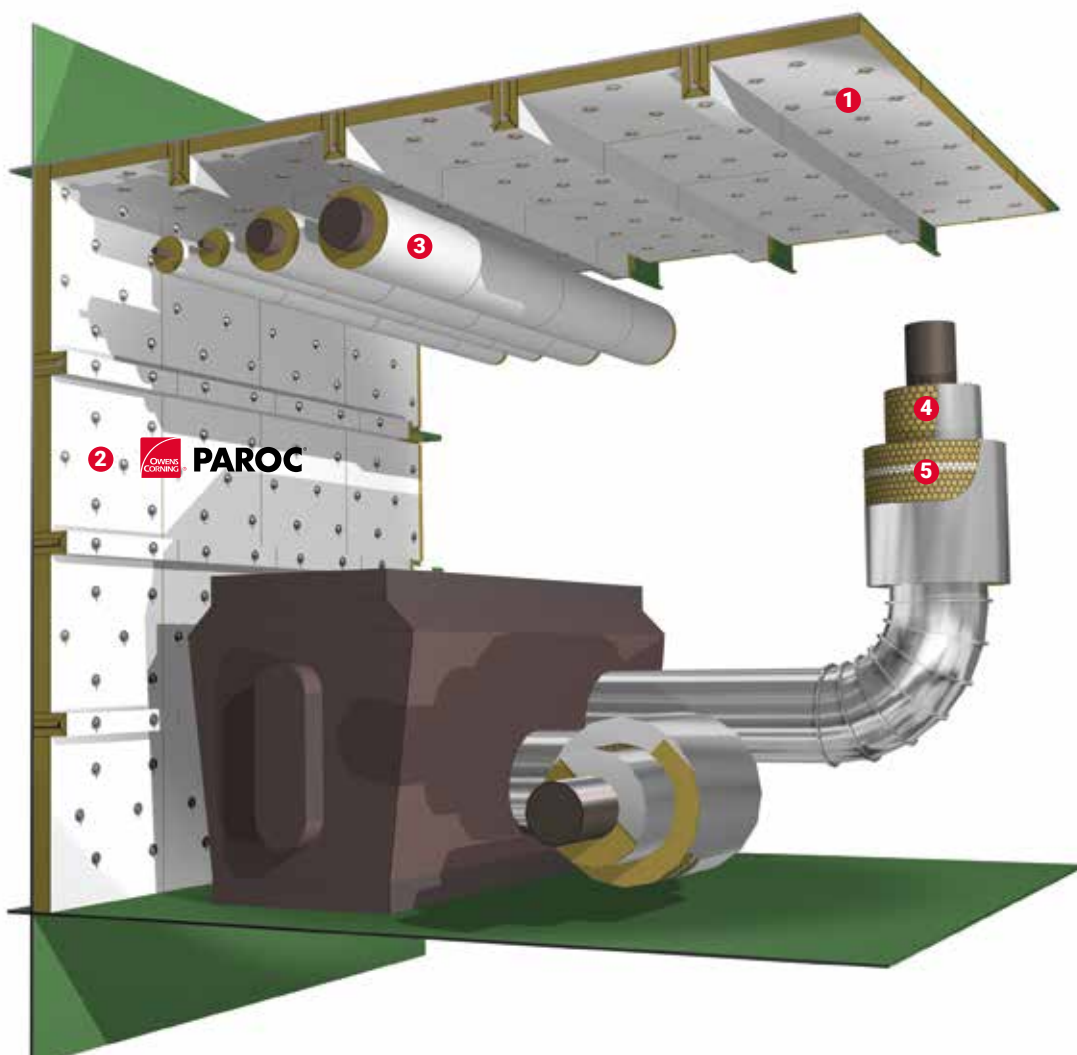
Example of H120 class solution for steel bulkheads with PAROC Marine Fire Slab 100 G1, insulating thickness on bulkhead and stiffener is 60 + 60 mm.

Steel Bulkhead H60, Restricted, Fire Against Insulated Side



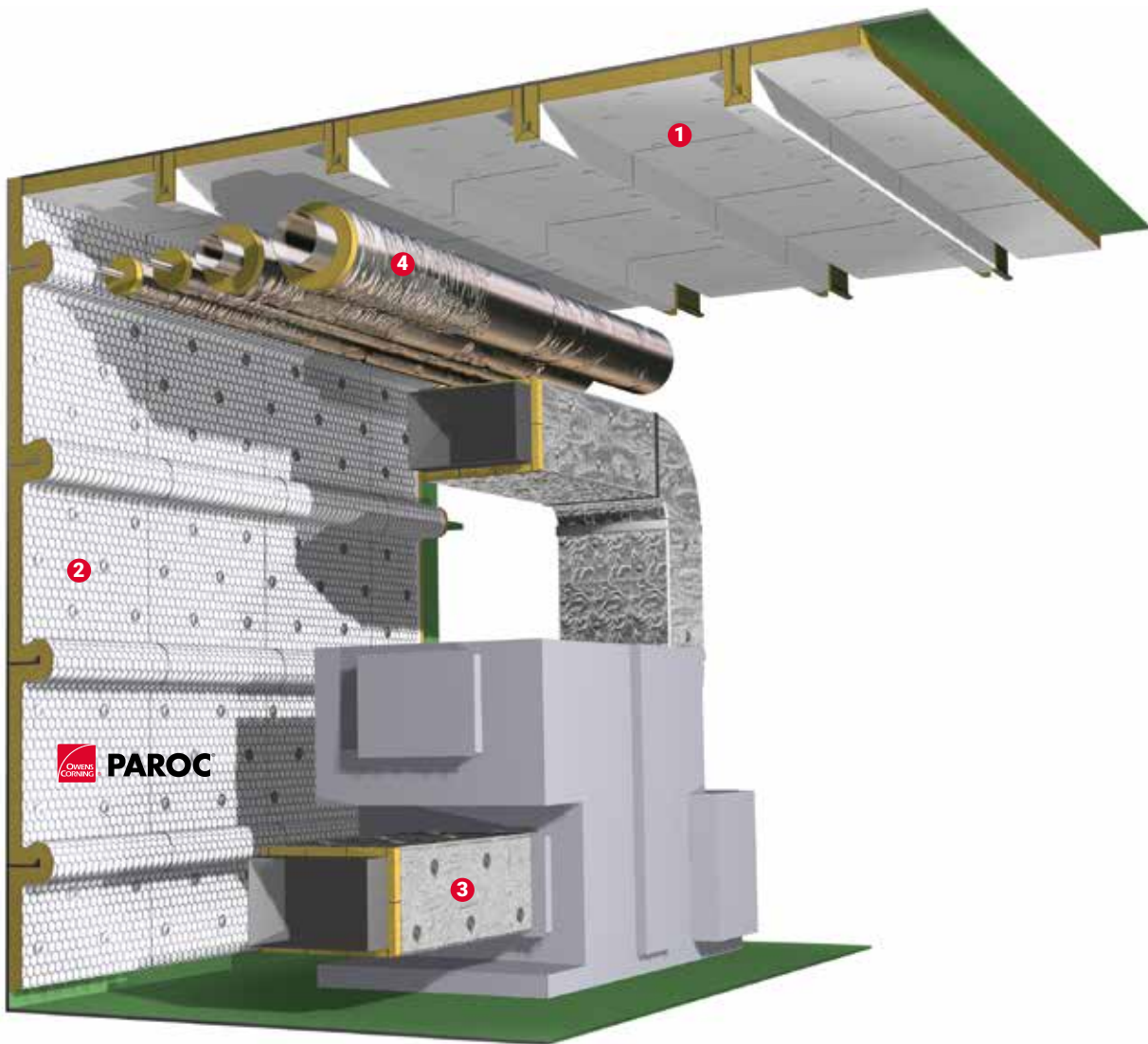
Example of H60 class solution for steel bulkheads with PAROC Marine Fire Slab 100 G1, insulating thickness on bulkhead and stiffener is 50 + 50 mm.

ENGINE ROOMS



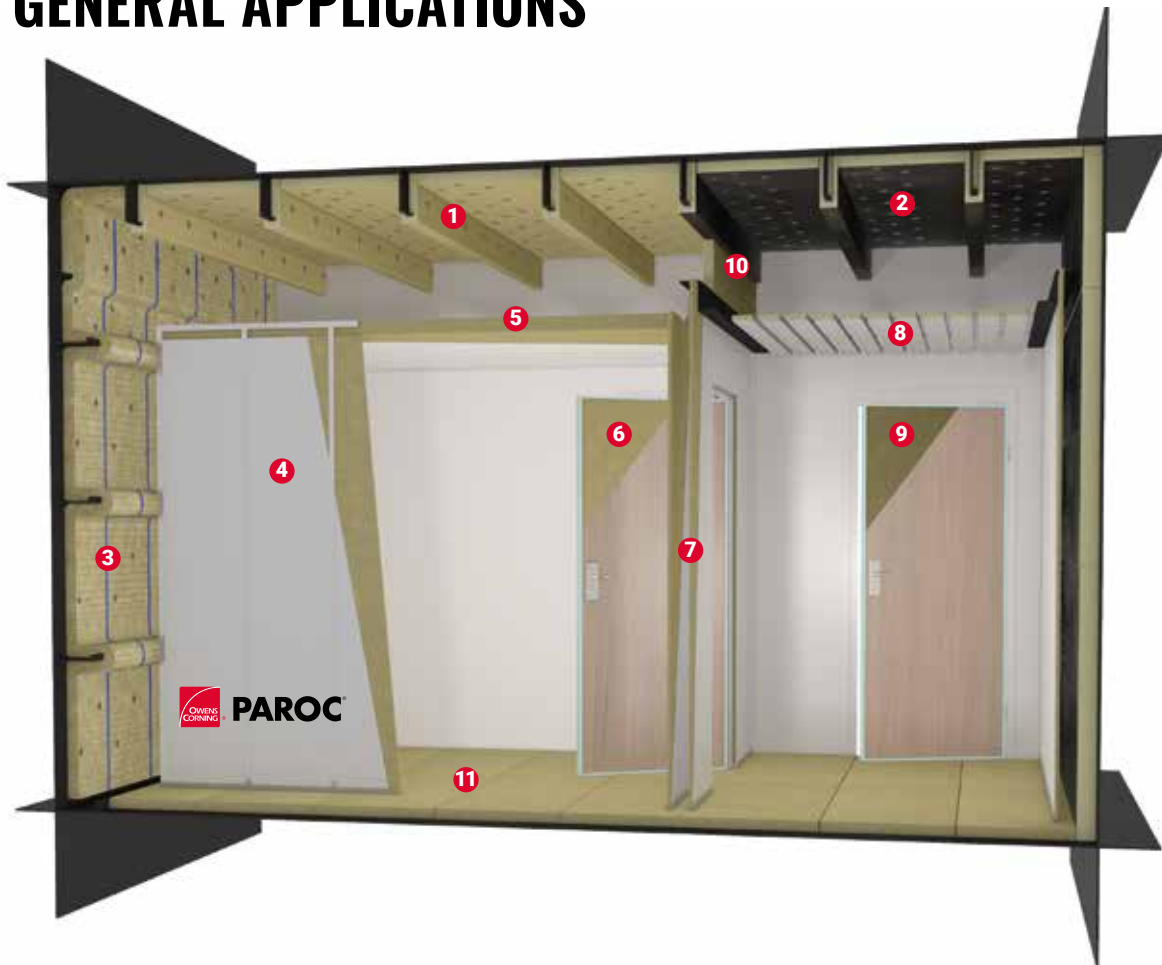
Class	Product	Nominal density kg/m ³	Insulating thickness level/stiffener, mm
Decks:			
1	A60 PAROC Marine Navis Slab 60 + white glass fibre facing	60	50/30
Bulkheads:			
2	A60 PAROC Marine Navis Slab 60 + white glass fibre facing	60	70/30
Pipes (Vapour, Heating, Fuel Oil, Sewage, Warm Water, Etc.):			
3	PAROC Pro Section 100 G4 or G7	100	
4	PAROC Marine Wired Mat 100	100	80
Exhaust Pipe Dampers:			
5	PAROC Marine Wired Mat 100	100	80/80

AIR-CONDITIONING MACHINE ROOMS



Class	Product	Nominal density kg/m ³	Insulating thickness level/stiffener, mm*
Decks:			
1	A0 PAROC Marine Slab 40 + white glass fibre facing	60	50/50
Bulkheads:			
2	A0 PAROC Marine Wired Mat 40 + white glass fibre facing	60	50/50
Air Conditioning Ducts:			
3	PAROC Pro Lamella Mat AluCoat	100	25
Pipes (Cooling and Cold Water):			
4	PAROC Hvac Section AluCoat T or PAROC Hvac Combi AluCoat T	100	20-50

GENERAL APPLICATIONS



Class		Product	Nominal density kg/m ³	Insulating thickness level/stiffener, mm*
Decks:				
	1	A60	PAROC Marine Navis Slab 60	50/30
	1	A60	PAROC Marine Fire Slab 100	40/25
	2	A60	PAROC Marine Navis Slab 60 + black glass fibre facing	50/30
	2	A60	PAROC Marine Fire Slab 100 + black glass fibre facing	40/25
Bulkheads:				
	3	Thermal	PAROC Marine Wired Mat 40	50 - 100/50 - 100
		Thermal	PAROC Marine Slab 40	50/50
Cabin:				
Wall	4	B15**	PAROC Marine Slab 150 + grey non-woven tissue	10
Roof	5	B15**	PAROC Marine Slab 80	70
Door	6	B15**	PAROC Marine Slab 160	40
Corridor:				
Wall	7	B15**	PAROC Marine Slab 160	15
Roof	8	Sound	PAROC Marine Slab 80	25
Door	9	A60**	PAROC Marine Slab LO 150	70
Wall extension	10	B15	PAROC Marine Navis Slab 100 AluCoat	30
Floating Floor:				
	11	A60	PAROC Marine Floor Slab 140	50

*Please check the validity of the certification from Paroc sales.

** An example of customer constructions where PAROC products are used.

Examples of latest Paroc Marine references

Name	Type	Year	Shipyard	Country
Mein Schiff 2	Cruise Ship	2019	Meyer, Turku	Finland
MSC Bellissima	Cruise Ship	2019	Chantiers de l'Atlantique	France
MSC Grandiosa	Cruise Ship	2019	Chantiers de l'Atlantique	France
Costa Venezia	Cruise Ship	2019	Fincantieri, Monfalcone	Italy
Carnival Panorama	Cruise Ship	2019	Fincantieri, Marghera	Italy
Sky Princess	Cruise Ship	2019	Fincantieri, Castellammare/Monfalcone	Italy
MSC Seashore	Cruise Ship	2019	Fincantieri, Monfalcone	Italy
Scarlet Lady	Cruise Ship	2019	Fincantieri, La Spezia/ Castellammare	Italy
Hondius 484	Polar Expedition	2019	Brodosplit, Split	Croatia
Mein Schiff 1	Cruise Ship	2018	Meyer, Turku	Finland
Carnival Horizon	Cruise Ship	2018	Fincantieri, Marghera	Italy
Seaburn Ovation	Cruise Ship	2018	Fincantieri, Genova Sestri Ponente	Italy
MSC Seaview	Cruise Ship	2018	Fincantieri, Monfalcone	Italy
MSC Seaside	Cruise Ship	2018	Fincantieri, Monfalcone	Italy
Viking Orion	Cruise Ship	2018	Fincantieri, Ancona	Italy
Nieuw Statendam	Cruise Ship	2018	Fincantieri, Marghera	Italy
Hammershus	Car Ferry	2018	Rauma Marine Constructions	Finland
Evgeny Primakov	Icebreaking Supply/Stand-by vessel	2018	Arctech Helsinki Shipyard	Finland
MSC Meraviglia	Cruise Ship	2017	Chantiers de l'Atlantique	France
MSC Meraviglia	Cruise Ship	2017	STX France	France
MS Asterix	Naval Auxiliary Supply Vessel	2017	Chantier Davie Shipyard	Canada
Stepan Makarov	Icebreaking Supply/Stand-by vessel	2017	Arctech Helsinki Shipyard	Finland
Fedor Ushakov	Icebreaking Supply/Stand-by vessel	2017	Arctech Helsinki Shipyard	Finland
Tallink Megastar	Car Ferry	2017	Turku Shipyard	Finland
Gennadiy Nevelskoy	Icebreaking Supply/Stand-by vessel	2017	Arctech Helsinki Shipyard	Finland
Mein Schiff 6	Cruise Ship	2017	Turku Shipyard	Finland
Mein Schiff 5	Cruise Ship	2016	Turku Shipyard	Finland
Seabourn Encore	Cruise Ship	2016	Fincantieri	Italy
Viking Sky	Cruise Ship	2016	Fincantieri	Italy
Seven Seas Explorer	Cruise Ship	2016	Fincantieri	Italy
Carnival Vista	Cruise Ship	2016	Fincantieri	Italy
Viking Sea	Cruise Ship	2016	Fincantieri	Italy
Koningsdam	Cruise Ship	2016	Fincantieri	Italy
Saffron	Superyacht	2016	Mariotti	Italy
Genting Dream	Cruise Ship	2016	Meyer Werft, Papenburg	Germany
Ovation of the Seas	Cruise Ship	2016	Meyer Werft, Papenburg	Germany
Polaris	Multipurpose icebreaker	2016	Helsinki Shipyard	Finland
Le Lyrial	Cruise Ship	2016	Fincantieri	Italy
Viking Star	Cruise Ship	2015	Fincantieri	Italy
Britannia	Cruise Ship	2015	Fincantieri	Italy
Murmansk	Icebreaking Supply/Stand-by vessel	2015	Helsinki Shipyard	Finland
Norwegian Escape	Cruise Ship	2015	Meyer Werft, Papenburg	Germany
Anthem of the Seas	Cruise Ship	2015	Meyer Werft, Papenburg	Germany
Mein Schiff 4	Cruise Ship	2015	Turku Shipyard	Finland
Mein Schiff 3	Cruise Ship	2014	Turku Shipyard	Finland
Regal Princess	Cruise Ship	2014	Fincantieri	Italy
Costa Diadema	Cruise Ship	2014	Fincantieri	Italy
Turva	Coast guard vessel	2014	Rauma Shipyard	Finland
Baltika	Multipurpose energy and rescue vessel	2014	Helsinki Shipyard	Finland
Searoad Mersey II	RoRo ferry	2014	Flensburger Schiffbaugesellschaft	Germany
Loch Seaforth	RoPax ferry	2014	Flensburger Schiffbaugesellschaft	Germany
Sonne	Research vessel	2014	Meyer Werft, Papenburg	Germany
Aleksey Dhirikov	Icebreaker	2013	Helsinki Shipyard	Finland
Stella	Ferry	2013	Rauma Shipyard	Finland
Vitus Bering	Icebreaker	2012	Helsinki Shipyard	Finland
RV Mirabilis	Fishery research vessel	2012	Rauma Shipyard	Finland
Viking Grace	Cruise Ship	2012	Turku Shipyard	Finland
Spirit of France	Car Ferry	2012	Rauma Shipyard	Finland
Spirit of Britain	Car Ferry	2011	Rauma Shipyard	Finland
S.A. Agulhas II	Arctic survey and research vessel	2011	Rauma Shipyard	Finland
Allure of the Seas	Cruise Ship	2010	Turku Shipyard	Finland
Oasis of the Seas	Cruise Ship	2009	Turku Shipyard	Finland
Armorique	Cruise Ferry	2009	Rauma Shipyard	Finland
Baltic Queen	Cruise Ferry	2009	Rauma Shipyard	Finland

QUALITY AND ENVIRONMENT

PAROC stone wool products are made from clean, natural material. They are environmentally friendly throughout their lifecycle, causing no harm to nature during or after use. Stone wool does not contain any ingredients or chemicals that prevent or impede recycling. The use of PAROC products increases both the comfort and safety of the environment in which they are installed, creating a better place to work – as well as a more efficient to work – as well as a more efficient process.

Paroc factories have been certified according to the Quality Management System ISO 9001 and Environmental System ISO 14001. Because of these systems, you can be sure that products that emerge from our factories are of a consistently high quality and are produced in a way that emphasises environmental considerations.

Health and Safety

PAROC products are safe to use. No CFCs or HCFCs are used in the production of the products. PAROC products also fulfil NoteQ of EU Commission Directive 97/69/EC.

This means that stone wool fibres are biodegradable and are not classified as a possible human carcinogenic. They do not contain asbestos.

Our health and safety data sheets are available on our web pages at www.paroc.com.

STORAGE AND HANDLING

PAROC stone wool products are made from a naturally robust material. They are easy to store and install, and safe to handle.

Storage

If the products are stored outdoors, they must be protected from rain. Stack the packages on a flat platform that doesn't touch the ground. Cover the stacks with a waterproof tarpaulin or plastic sheet if necessary. If the products get wet despite these measures, they can be dried and used as normal. Stone wool dries quickly and its becoming wet will not change its properties.

Our preformed insulation components are quick to install and do not need much cutting work on site. Handle the product packages in a manner that prevents damage. Care must be taken not to break the edges or corners of the packages, especially during unloading.

Personal Safety Equipment

Scientific studies show that stone wool fibres do not harm your health, but the use of protective equipment is recommended to avoid skin irritation.



Use personal protection equipment that meets your particular needs, and keep your work clothing separate from your other clothing. It is also advisable to wear protective goggles if your eyes are sensitive to dust. This is particularly important when working with overhead insulation. If you wear contact lenses, you should always wear close-fitting protective goggles. A dust mask is also necessary if the amount of dust is significant.

You can read more about personal safety in insulation work on our web pages at www.paroc.com.

TRUSTED SERVICE AND ADVICE

At Paroc, we do more than produce high quality stone wool insulation products - we also supply the help and advice necessary to make your job as easy and straightforward as possible. We have developed a popular range of practical tools that are as valued by designers as they are by installers. Pocket guides, dimensioning software, simple explanations of laws and regulations, and a content-rich website are just some of the free resources that our customers benefit from. If any of your questions remain unanswered, please let us know – we are always grateful for any tips on how to make our service even better.

Insulation Education

At Paroc, we want to share our knowledge in order to help you get the utmost out of our products. That's why we can arrange specialised training on industrial insulation. In our seminars, you can learn, for example, about the purpose of insulation, the difference between insulation for pipes and flue ducts, and how to choose the right solution. We also cover the guidelines and regulations that apply to insulation in your area. Please contact us for further information.

Personal Contacts for the Best Solution

Early contact with Paroc confers many advantages when it comes to identifying the optimal insulation solution for your particular requirements. At the designing and planning stage, it is important to consider what kind of properties the insulation solution should possess. Paroc's specialists are always on hand to help and advice, and are experts on customising products and solutions to fit your specific requirements. It is often beneficial for us to come and visit the site personally so that together we can ascertain the best solution and installation method. This helps to maximise the performance and service life of the insulation.



Technical Advice

Every year we receive a lot of questions about insulation theory and products. No question is too big or too small for our insulation experts. We can advise on the need to insulate, the right products to choose, installation methods, and laws and regulations. If there's a question that we can't answer directly, we'll ask for help from our wide network of contacts in all areas of the insulation field.

Punctual Logistics

Paroc is justifiably renowned for its punctual logistics operation. Under normal circumstances, you will receive the insulation you need shortly after placing the order. This is a service that our customers value highly and have come to rely on.



DURABLE

PAROC® stands for energy-efficient and fire safe insulation solutions of stone wool for new and renovated buildings, marine and offshore, acoustics and other industrial applications. Behind those products, there is an 80-year history of stone wool production knowhow backed with technical insulation expertise and innovation.



REUSABLE

Building Insulation offering covers a wide range of products and solutions for all traditional building insulation. The building insulation products are mainly used for the thermal, fire and sound insulation of exterior walls, roofs, floors and basements, intermediate floors and partitions. Sound absorbing ceilings and wall panels for interior acoustic control, as well as industrial noise control products, are available in the range.



**SOUND
REDUCING**

Technical Insulation offering includes thermal, fire and sound insulation in HVAC systems, industrial processes and pipework, industrial equipment as well as shipbuilding and offshore industry.



FIRE PROOF

For more information please visit www.paroc.com



**MOISTURE
PROOF**



SAFE



**ENERGY
EFFICIENT**

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