



**New  
Constructions**  
according to  
**IMO 2010  
FTP Code**

# SeaRox

Marine & Offshore  
Insulation

## Products & Solutions

**ROCKWOOL®**  
TECHNICAL INSULATION



# Technical insulation shaped by experts

EXPERT  
TOOL



Order your SeaRox Technical Guidelines  
at [www.rockwool-rti.com](http://www.rockwool-rti.com)

**ROCKWOOL Technical Insulation – a subsidiary of the ROCKWOOL International Group – offers innovative technical insulation solutions for the process & power generated industry and the shipbuilding & offshore market worldwide.**

To that end, we have subsumed our product range into two specialist categories. SeaRox comprises the full marine and offshore range and ProRox covers all our insulation solutions for the process industry and for technical installations on board and offshore. Through our two product lines, our experts offer a full spread of products and systems guaranteeing the highest possible thermal, acoustical and fire safe insulation of all technical installations. Our more than 75 years of experience is reflected in a complete set of high grade

products and expert advice. Today, we remain fully committed to providing the very best service in the market and a total range of cutting-edge insulation solutions.

For many years we have been one of the biggest suppliers within the shipbuilding industry and offshore. As part of our global strategic approach we offer a uniform, transparent and harmonized product range throughout the world – from the United Kingdom to China. In the marine and offshore industry this is crucial. It makes it easier for you to ensure the right material in your own country and for your international projects across the borders.





## We share our knowledge to your advantage

In addition to providing innovative products, ROCKWOOL Technical Insulation is able to draw on in-depth expertise to ensure that end users in the shipbuilding, offshore and the process industries are given the best and most advanced insulation solutions.

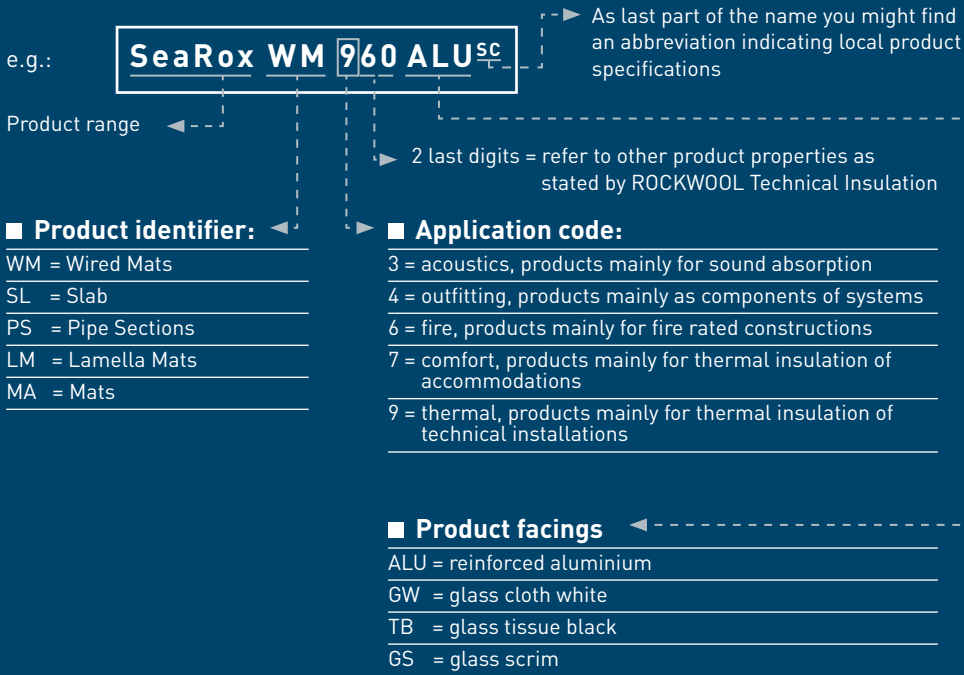
The key to our success is the combination of excellent insulation products and outstanding people who know exactly what they are talking about. Thanks to their expertise and extensive experience, we can offer exceptional stone wool solutions and an impeccable service. With technical support on high level we are prepared to help you to choose the optimal solutions and secure the necessary documentation.

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## "SeaRox" the new product name

The SeaRox products have been given new names. This makes it even easier to find the exact product you need quickly, wherever you are working. Each product name is structured in the same clear way:



# SeaRox

## Marine & Offshore Insulation

Under the SeaRox name we market a full range of fire-safe solutions for the ship building industry that also offer optimal acoustic, thermal insulation as well as solutions for insulation of technical installations on-board. The key property of all these products is outstanding thermal insulation, which helps keeping energy consumption under control. Naturally, they also meet the most stringent demands with respect to acoustic insulation and fire resistance. We have fine-tuned our marine and offshore range, too, bearing the increasing necessity for an efficient, clear product offering in mind.

NEW NAME	OLD NAME	NEW NAME	OLD NAME
<b>■ Comfort Insulation</b>		<b>■ Firesafe Insulation</b>	
SeaRox MA 700 GS	Shiprock Plus	SeaRox WM 620	Marine Wired Mat 90
SeaRox MA 700 ALU	Shiprock ALU	SeaRox WM 640	Marine Wired Mat 105
SeaRox SL 720	Marine Batts 32	SeaRox SL 620	Marine Firebatts 100
SeaRox MA 720 ALU	Marine Batts 32 RL	SeaRox SL 640	Marine Firebatts 130
SeaRox SL 740	Marine Batts 45	SeaRox SL 660	HC Firebatts 150
SeaRox MA 740 ALU	Marine Batts 45 RL	SeaRox WM 660	HC Wired Mat 150
		SeaRox PS 620 ALU <sup>SC</sup>	Marine Firebatts 100 PS
<b>■ Acoustic Insulation</b>		<b>■ Thermal Insulation</b>	
SeaRox SL 320	Marine Slab 60	SeaRox SL 970	Marine Firebatts 110
SeaRox SL 340	Marine Slab 80	SeaRox LM 900 ALU	Marine Lamella Mat 32
SeaRox Acoustic Foil	Marine Acoustic Foil	SeaRox WM 950	Marine Wired Mat 80
<b>■ Outfitting Insulation</b>		ProRox PS 960 ALU	ROCKWOOL 800*
SeaRox SL 436	Marine Slab 140	ProRox PS 960	Pipe Sections 850*
SeaRox SL 440	Marine Slab 150		
SeaRox SL 470	Marine Slab 180		
SeaRox SL 480	Marine Slab 200		

Alternative facings may be available

\* Part of ROCKWOOL Technical Insulation assortment for process industry, ProRox

# ROCKWOOL Technical Insulation - not just products and constructions



## Technical Service

IMO as well as other marine authorities and classification societies are constantly updating the regulations for passive fire protection, noise reduction and thermal insulation. With technical support on a high level we are prepared to help our clients choose the optimal solutions and secure the necessary documentation.

## Research and Development

Being part of the ROCKWOOL Group intensive research and developments efforts mean that our product and constructions are continuously being developed and improved to meet our customer's wishes and needs both today and in the future.



## Green Passport (Hong Kong International Convention)

During recent years we have experienced an increased focus on health and safety onboard. As a result Green Passports have been introduced according to IMO Res A.980 [24].

The idea of a green passport is for all vessels to carry a document listing all the potentially hazardous materials on board a vessel. Inventory of Hazardous Materials as per resolution MEPC.197(62). This document will stay with the ship throughout its lifespan and up until it is decommissioned and sent to the ship breaking yard.

All ROCKWOOL Technical Insulation stone wool products for the marine and offshore market produced at any European ROCKWOOL production plant will not be classified as hazardous or potentially hazardous material in relation to the mentioned IMO resolution (MEPC.197(62) Tables A, B and C). Therefore ROCKWOOL insulation has no impact to the inventory of hazardous material.

## Health and Safety

As a result of the intensive development within the Group a high-alumina low silica wool has been developed. This is a high bio-soluble fibre, Roxul@1000, with an increased safety margin in comparison with traditional mineral wool. Roxul@1000 fibres are world wide exonerated from every classification.



## Certificates and Documentation

All SeaRox products and constructions have been tested according to the latest IMO regulations for both quality and environment management and approved by all major classification societies just as ROCKWOOL Technical Insulation is certified according to the latest MED directive (EC Council Directive 96/98/EC - Marine Equipment Directive). All our products produced at any European ROCKWOOL production are produced and certified according to the EUCEB regulation. All SeaRox products are asbestos free.

### Project References:

Commercial ships  
Passenger vessels  
Cruise liners  
Yachts  
Navy ships  
Platforms  
Accommodation units

## References

ROCKWOOL Technical Insulation has been active in the marine and offshore sector world wide during the last 30 years. During recent years our material has been used frequently in all different kind of projects like:

- Commercial ships
- Passenger vessels and cruise liners
- Yachts
- Navy ships
- Platforms and accommodation units

## Find all the documents you need for your marine & offshore projects

### Check out the new SeaRox Document Finder!

ROCKWOOL Technical Insulation has developed a new easy-to-use and handy search tool on the international SeaRox Marine & Offshore website.

The SeaRox Document Finder enables you to find all the documents you need for your projects, quickly and conveniently. Type approvals, product datasheets, drawings... – simply add what you need to your basket and download as a zip file or forward by email. You no longer need to go through the whole website to find your documents.

Visit us at [www.rockwool-rti.com](http://www.rockwool-rti.com)



# New Constructions, New Standard for Safety

## IMO 2010 FTP Code

As of 1st July 2012 a new fire test procedure within the marine sector, IMO 2010 FTP Code, came into force. The test procedures have been revised in order to maintain the highest practical level of safety as well as the harmonisation of certified test institutes to the same level.

To fulfill the new requirements ROCKWOOL Technical Insulation has developed and tested a new range of PFP (Passive Fire Protection) constructions. The use of our new constructions ensures compliance with the latest standard in the market; IMO 2010 FTP Code.

As first step ROCKWOOL Technical Insulation introduces a range of new constructions which cover the main solutions for A-rated steel passive fire protection constructions:

- **A-30 Steel Bulkhead and Deck**
- **A-60 Steel Bulkhead and Deck**
- **A-60 Steel Bulkhead restricted**

## Main advantages:

- **Future-proof constructions - tested according to the latest standard**
- **Optimized logistics - main constructions possible with only one product in two dimensions**
- **Uniform pin design for all constructions**

**This new and optimized SeaRox product range offers more efficient logistics with less items to stock and easier handling from design to installation.**

**SeaRox  
SL 620**

30 mm

50 mm

## New SeaRox Product Range and Optimized Logistic

As part of the introduction of new solutions ROCKWOOL Technical Insulation has at the same time used the opportunity to optimize the SeaRox product assortment and simplify the range of constructions.

All 5 main constructions can be insulated with only one product in two dimensions:

- **SeaRox SL 620, 30 mm and 50 mm.**



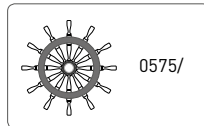


## New Certificates

The range of new fire rated constructions have been approved by our notified body, Det Norske Veritas, and new certificates have been issued.

To clearly distinguish between constructions which have been tested according to either the old or new FTP Code, all new constructions are issued on separate certificates. As existing certificates, tested according to the old standard expire they will be phased out.

To find our new MED-certificates and to be updated in the status of new certificates please visit our website: [www.rockwool-rti.com](http://www.rockwool-rti.com).



## Overview of New PFP Constructions

Below you will find an overview of the range of new PFP constructions according to IMO 2010 FTP Code:

SeaRox SL 620	Insulation thickness	
	steel plate	stiffener
A-30 steel bulkhead	50 mm	30 mm
A-30 steel deck	30 mm	30 mm
A-60 steel bulkhead	75 mm (alt. 50+30 mm)	30 mm
A-60 steel bulkhead restr.	50 mm	30 mm
A-60 steel deck	50 mm	30 mm

# Existing certificates will still be valid after the implementation of the new test methods.

As a result of the new IMO 2010 FTP Code, the existing solutions in the market will be phased out over the coming years.

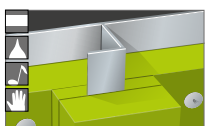
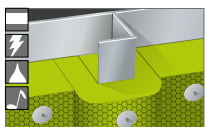
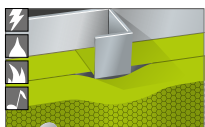
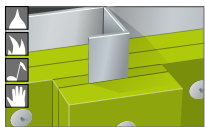
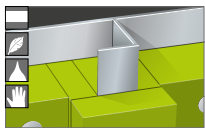
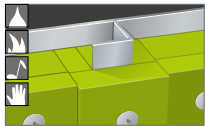
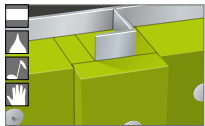
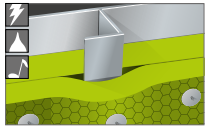
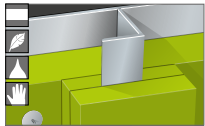
According to the IMO 2010 FTP Code, existing certificates will still be valid; however the following limitations regarding obtaining new certificates or the renewing of existing certificates have been implemented:





- Type approval certificates will not be issued on the basis of test reports more than 5 years old.
- Type approvals will not be renewed without retesting if the test report is more than 15 years old.



# A-Constructions

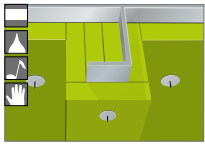
## Steel Bulkhead



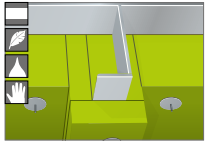
Product	Density (kg/m <sup>3</sup> )	Thickness	Weighted sound reduction R <sub>w</sub> (dB)	Weighted sound absorption (level product)	Thermal conductivity (W/mK) at 10°C mean temp.	U-value level product (W/m <sup>2</sup> K) at 10°C mean temp	Water absorption (short term)
<b>A-30 steel Bulkhead</b> 							
SeaRox SL 620	100	Plate 50 mm Stiffener 30 mm	45 *	0.85	0.035	0.70	< 1 kg/m <sup>2</sup>
<b>A-30 steel Bulkhead</b>							
SeaRox SL 740	45	Plate 50 mm Stiffener 25 mm	45 **	0.75	0.034	0.68	< 1 kg/m <sup>2</sup>
<b>A-30 steel Bulkhead</b>							
SeaRox WM 620	90	Plate 50 mm Stiffener 30 mm		0.90	0.034	0.68	< 1 kg/m <sup>2</sup>
<b>A-60 steel Bulkhead</b> 							
SeaRox SL 620	100	Plate 75 mm Stiffener 30 mm	46 *	0.90	0.035	0.47	< 1 kg/m <sup>2</sup>
<b>A-60 steel Bulkhead</b> 							
SeaRox SL 620	100	Plate 50 + 30 mm Stiffener 30 mm	47 *	0.90	0.035	0.44	< 1 kg/m <sup>2</sup>
<b>A-60 steel Bulkhead</b>							
SeaRox SL 620	100-115	Plate 60 mm Stiffener 25 mm	45 *	0.90	0.035	0.58	< 1 kg/m <sup>2</sup>
<b>A-60 steel Bulkhead</b>							
SeaRox SL 640	130	Plate 2 x 30 mm Stiffener 30 mm	48 *	0.90	0.035	0.58	< 1 kg/m <sup>2</sup>
<b>A-60 steel Bulkhead</b>							
SeaRox WM 620	90	Plate 2 x 45 mm Stiffener 45 mm	49 **	0.95	0.034	0.38	< 1 kg/m <sup>2</sup>
<b>A-60 steel Bulkhead</b>							
SeaRox WM 640	105	Plate 75 mm Stiffener 30 mm	47 **	0.90	0.034	0.45	< 1 kg/m <sup>2</sup>
<b>A-60 steel Bulkhead restricted</b> 							
SeaRox SL 620	100	Plate 50 mm Stiffener 30 mm	45 *	0.85	0.035	0.70	< 1 kg/m <sup>2</sup>
<b>A-60 steel Bulkhead restricted</b>							
SeaRox SL 620	100-115	Plate 40 mm Stiffener 40 mm	47 **	0.80	0.035	0.88	< 1 kg/m <sup>2</sup>
<b>A-60 steel Bulkhead restricted</b>							
SeaRox SL 640	130	Plate 40/50 mm Stiffener 40/50 mm (Check certificate for specific thickness)		0.80	0.035	0.70	< 1 kg/m <sup>2</sup>

\* Test specimen 5 mm steel plate    \*\* Test specimen 6 mm steel plate

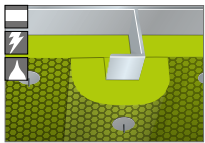
## Steel Deck



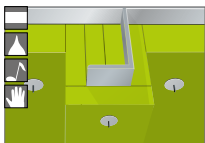
Product	Density (kg/m <sup>3</sup> )	Thickness	Weighted sound reduction Rw (dB)	Weighted sound absorption (level product)	Thermal conductivity (W/mK) at 10°C mean temp.	U-value level product (W/m <sup>2</sup> K) at 10°C mean temp	Water absorption (short term)
<b>A-30 steel Deck</b>							
<b>SeaRox SL 620</b>	100	Plate 30 mm Stiffener 30 mm	44 *	0.60	0.035	1.17	< 1 kg/m <sup>2</sup>



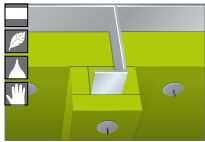
<b>A-30 steel Deck</b>							
<b>SeaRox SL 740</b>	45	Plate 50 mm Stiffener 30 mm	45 **	0.75	0.034	0.68	< 1 kg/m <sup>2</sup>



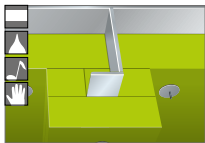
<b>A-30 steel Deck</b>							
<b>SeaRox WM 620</b>	90	Plate 30 mm Stiffener 30 mm			0.034	0.68	< 1 kg/m <sup>2</sup>



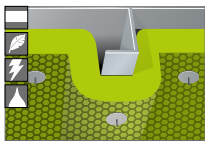
<b>A-60 steel Deck</b>							
<b>SeaRox SL 620</b>	100	Plate 50 mm Stiffener 30 mm	45 *	0.85	0.035	0.70	< 1 kg/m <sup>2</sup>



<b>A-60 steel Deck</b>							
<b>SeaRox SL 620</b>	100-115	Plate 40 mm Stiffener 25 mm	46 **	0.80	0.035	0.88	< 1 kg/m <sup>2</sup>



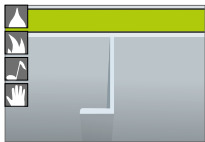
<b>A-60 steel Deck</b>							
<b>SeaRox SL 640</b>	130	Plate 40 mm Stiffener 40 mm		0.80	0.035	0.88	< 1 kg/m <sup>2</sup>



<b>A-60 steel Deck</b>							
<b>SeaRox WM 620</b>	90	Plate 45 mm Stiffener 45 mm	46 **	0.90	0.034	0.76	< 1 kg/m <sup>2</sup>



<b>A-60 Floating Floor</b>							
<b>SeaRox SL 436</b>	140	60 mm (+ 1.5 + 3 mm steel top plate)			0.035	0.58	< 1 kg/m <sup>2</sup>



<b>A-60 Floating Floor</b>							
<b>SeaRox SL 480</b>	200	2 x 30 mm (+ 2 mm steel top plate)			0.037	0.62	< 1 kg/m <sup>2</sup>

\* Test specimen 5 mm steel plate    \*\* Test specimen 6 mm steel plate

### One layer solution

The construction is based on a solution where the construction is made with one product in one layer. This leads to a faster installation.

### Low construction weight

The construction is based on products with a low density and/or low thickness which leads to a low total construction weight.

### Fast installation

The construction is based on Mats which reduces the cutting especially around stiffeners, and consequently faster installation time.

### Low water absorption

The construction consists of products with low water absorption which secure and maintain optimal product properties.

### Safe solution

The constructions are based on a multiple, typical two layer solution which results in a more safe solution especially due to staggered joints.

### Optimal sound properties

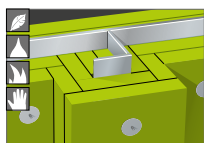
The construction is based on products with higher density and/or more thickness which results in better sound properties.

### Easy handling

The constructions are based on Slabs, where the small size and fixed structure of the products give an easy handling in respect to cutting and installation.

# A-Constructions

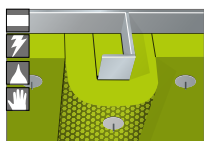
## Alu Bulkhead



Product	Density (kg/m <sup>3</sup> )	Thickness	Weighted sound reduction Rw (dB)	Weighted sound absorption (level product)	Thermal conductivity (W/mK) at 10°C mean temp.	U-value level product (W/m <sup>2</sup> K) at 10°C mean temp	Water absorption (short term)
<b>A-60 Alu Bulkhead</b>							
SeaRox SL 620	100-115	Plate 2 x 30 mm Stiffener 2 x 30 mm		0.90	0.035	0.58	< 1 kg/m <sup>2</sup>
<i>Insulation on both sides of the alu plate</i>							
<b>A-60 Alu Bulkhead</b>							
SeaRox SL 640	130	Plate 2 x 30 mm Stiffener 2 x 30 mm	40 *	0.90	0.035	0.58	< 1 kg/m <sup>2</sup>
<i>Insulation on both sides of the alu plate</i>							
<b>A-60 Alu Bulkhead restricted</b>							
SeaRox SL 640	130	Plate 2 x 30 mm Stiffener 2 x 30 mm		0.90	0.035	0.58	< 1 kg/m <sup>2</sup>

\* Test specimen 6 mm alu plate

## Alu Deck

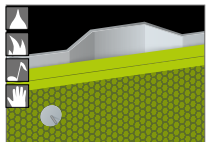
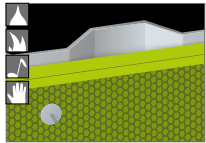
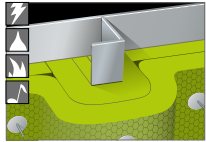
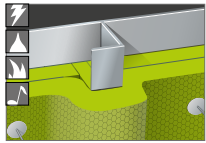


Product	Density (kg/m <sup>3</sup> )	Thickness	Weighted sound reduction Rw (dB)	Weighted sound absorption (level product)	Thermal conductivity (W/mK) at 10°C mean temp.	U-value level product (W/m <sup>2</sup> K) at 10°C mean temp	Water absorption (short term)
<b>A-30 Alu Deck</b>							
SeaRox SL 740 / SeaRox WM 620	45 / 90	Plate 50 mm Stiffener 45 mm		0.75	0.034	0.68	< 1 kg/m <sup>2</sup>
<b>A-60 Alu Deck</b>							
SeaRox SL 620	100-115	Plate 2 x 30 mm Stiffener 2 x 30 mm	40 *	0.90	0.035	0.58	< 1 kg/m <sup>2</sup>
<b>A-60 Alu Deck</b>							
SeaRox SL 640	130	Plate 2 x 30 mm Stiffener 2 x 30 mm		0.90	0.035	0.58	< 1 kg/m <sup>2</sup>

\* Test specimen 6 mm alu plate

# H-Constructions

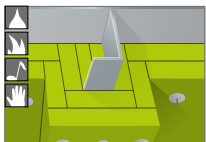
## Bulkhead



Product	Density (kg/m <sup>3</sup> )	Thickness	Weighted sound reduction Rw (dB)	Weighted sound absorption (level product)	Thermal conductivity (W/mK) at 10°C mean temp.	U-value level product (W/m <sup>2</sup> K) at 10°C mean temp	Water absorption (short term)
<b>H-60 Bulkhead restricted</b>							
SeaRox SL 660 / SeaRox WM 660	150	Plate 30 + 40 mm Stiffener 40 mm	48 **		0.035	0.50	< 1 kg/m <sup>2</sup>
<b>H-120 Bulkhead restricted</b>							
SeaRox SL 660 / SeaRox WM 660	150	Plate 30 + 40 mm Stiffener 2 x 40 mm	49 **		0.035	0.50	< 1 kg/m <sup>2</sup>
<b>H-60 non load bearing corrugated steel restricted</b>							
SeaRox SL 660 / SeaRox WM 660	150	50 mm SeaRox SL 660 40 mm SeaRox WM 660	44 *		0.035	0.39	< 1 kg/m <sup>2</sup>
<b>H-120 non load bearing corrugated steel restricted</b>							
SeaRox SL 660 / SeaRox WM 660	150	50 mm SeaRox SL 660 40 mm SeaRox WM 660	44 *		0.035	0.39	< 1 kg/m <sup>2</sup>

\* Test specimen 1.5 mm corrugated steel plate    \*\* Test specimen 6 mm steel plate

## Steel Deck



Product	Density (kg/m <sup>3</sup> )	Thickness	Weighted sound reduction Rw (dB)	Weighted sound absorption (level product)	Thermal conductivity (W/mK) at 10°C mean temp.	U-value level product (W/m <sup>2</sup> K) at 10°C mean temp	Water absorption (short term)
<b>H-60 steel Deck</b>							
SeaRox SL 660	150	Plate 2 x 50 mm Stiffener 2 x 50 mm	48 **	0.90	0.035	0.35	< 1 kg/m <sup>2</sup>

\*\* Test specimen 6 mm steel plate

### One layer solution

The construction is based on a solution where the construction is made with one product in one layer. This leads to a faster installation.

### Low construction weight

The construction is based on products with a low density and/or low thickness which leads to a low total construction weight.

### Fast installation

The construction is based on Mats which reduces the cutting especially around stiffeners, and consequently faster installation time.

### Low water absorption

The construction consists of products with low water absorption which secure and maintain optimal product properties.

### Safe solution

The constructions are based on a multiple, typical two layer solution which results in a more safe solution especially due to staggered joints.

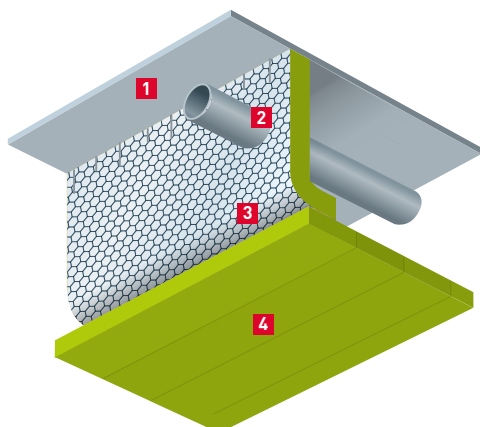
### Optimal sound properties

The construction is based on products with higher density and/or more thickness which results in better sound properties.

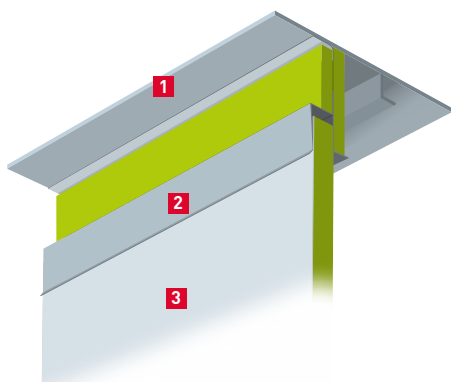
### Easy handling

The constructions are based on Slabs, where the small size and fixed structure of the products give an easy handling in respect to cutting and installation.

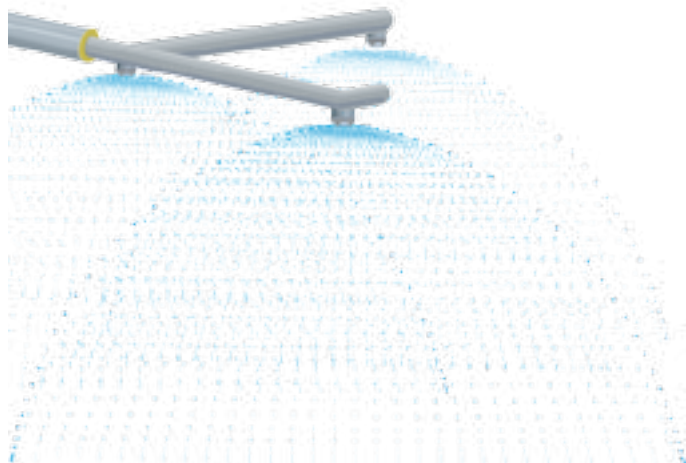
# Additional Fire Protection



- 1 Deck construction
- 2 Service penetration
- 3 Cut around penetration and wire mesh stitched together along joint
- 4 Suspended ceiling



- 1 B-15 extension - Deck construction
- 2 Top steel profile
- 3 B-15 lining panel



## Draught Stoppers

Draught stoppers are used above ceilings to avoid the spread of smoke and flames in case of fire. Normally the classification companies request a B-0 fire insulation above the ceiling. This can be made with SeaRox WM or SeaRox SL after request from the local surveyor or from the customer.

### Construction:

- SeaRox WM 640 ALU, min. 50 mm or SeaRox SL 620 ALU, min. 60 mm
- SeaRox SL 620 must be covered with wire mesh. Insulation fixed with  $\varnothing 3$  mm pins and secured with  $\varnothing 38$  mm washers.

## B-15 Extension

B-15 extension is used as a B-15 wall extension above the ceiling and prevents smoke and fire to spread above the ceiling. The B-15 extension solution has passed a B-15 fire test with SeaRox SL 470, 25 mm which fulfils the IMO demands.

Vessels have screens between the cabins with a fire class of B-0, B-15, A-15 or A-30. When a B-0 or B-15 separation is requested ROCKWOOL recommends using a B-15 construction. This construction consists of a normal B-15 wall and above the ceiling a 25 mm SeaRox SL 470.

## Fire Protection of Sprinkler Pipes

Seen in the light of the increasing sizes of passenger ships and growing number of passengers, a new amendment to SOLAS regulation „Safe return to port“ is applicable to all passenger ships built on or after 1st July 2010 stating that sprinkler pipes on passenger vessels need to remain operational in case of fire.

### The amendment is valid for:

- All passenger ships of 120 m or more,  
or
- Having three or more main vertical zones

Applicable also for ROPAX vessels and large offshore accommodations.

To fulfil the requirement ROCKWOOL Technical Insulation has introduced a Pipe Section called SeaRox PS 620 ALU. This product can be used not only for thermal insulation but also for fire protection according to IMO FTP Code. By using the already A-60 approved basis product, SeaRox SL 620 in approved thicknesses for Bulkhead and Deck, just cut into Pipe Sections the product is fulfilling the requirements.

# Thermal and Comfort Insulation



The requirements of the indoor climate and comfort have become more stringent during the recent years. The insulation constitutes an important factor of this, as it ensures obtaining the correct temperature – as comfort insulation.

The great advantage of the ROCKWOOL SeaRox products is that the high level of thermal insulation can be combined with excellent noise reduction capabilities and often fire protection constructions will also act as thermal comfort insulation.

All ROCKWOOL Technical Insulation products fulfil the IMO rules of “non-combustibility” and “low flame spread” and besides this the products have excellent water repellent properties which are also important as comfort insulation is often placed directly up against the outer construction with changing temperatures.

- 1: Thermal insulation can be used alone where there is no other demand for the deck and bulkhead.
- 2: Thermal insulation can also be used together with fire insulation or sound insulation.

In all cases when insulating against cold temperatures the wool must always be covered by a vapour tight surface. This surface can be aluminium foil or another kind of vapour barrier. The gaps should be tightly sealed with alu tape.

When adding additional insulation to a fire construction it should be documented and approved by the local surveyor.

The most common way of expressing thermal properties is by using the following nomenclature:

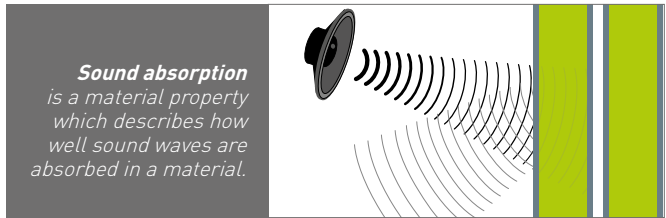
- Coefficient of the Thermal Transmission (U-value)
- Thermal Resistance (R)
- Thermal Conductivity ( $\lambda$ )

It is important to note that the  $\lambda$ -value for any given material varies with temperature.

## Lambda value ( $\lambda$ ) measurements on ROCKWOOL Technical Insulation products (nominal values):

Product $\lambda$ [W/mK]	$\lambda$ 10
SeaRox SL 720	0.037
SeaRox SL 740	0.034
SeaRox SL 320	0.034
SeaRox SL 340	0.034
SeaRox SL 436	0.035
SeaRox SL 440	0.035
SeaRox SL 480	0.040
SeaRox SL 620	0.034
SeaRox SL 970	0.035
SeaRox SL 640	0.034
SeaRox LM 900	0.040
SeaRox WM 950	0.035
SeaRox WM 620	0.035
SeaRox WM 640	0.035
SeaRox SL 660	0.034
ProRox PS 960/ ProRox PS 960ALU	0.034

# Sound Insulation



## Sound Insulation

Today an increasing focus on noise reduction is present, which results in more requirements for noise levels.

The new IMO noise code - resolution MSC.337(91) - enter into force 1 July 2014 (new contracts) 1 January 2015 (keel laying) and 1 July 2018 (full implementation). The new code replace the 1981 noise code A.468(XII). The new noise code is mandatory and introduces new requirements for the noise reduction measures on ships; the design, documentation and performance, as well as actual noise levels on-board.

The technical aspects in this area are quite complex and often require specialist companies to perform sound design work, calculations and final on board measurements.

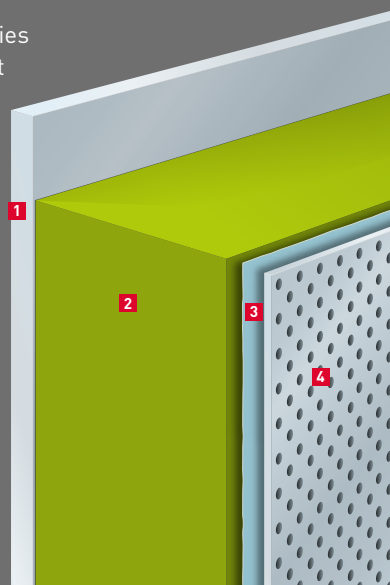
ROCKWOOL SeaRox products have excellent properties as; sound absorbers, stopping structural borne noise (i.e. with floating floor and bulkhead constructions) and as noise reduction by panels.

A large range of basic product measurements has been performed to create the necessary data for the further calculations. A series of typical constructions have also been tested for the noise reduction capabilities.






### SeaRox Acoustic Foil system especially designed for sound absorption in engine rooms

- Optimal sound properties
- Resistant to oil/oil mist
- Tested and approved
- Easy installation

- 1 Steel plate
- 2 SeaRox insulation
- 3 SeaRox Acoustic Foil
- 4 Perforated steel plate

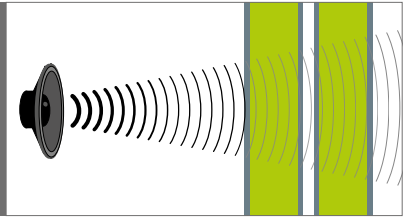


## Overview - absorption measurements












No	ROCKWOOL products	Weighted absorption
1	SeaRox SL 620, 30 mm	 $\alpha_w = 0.60$
2	SeaRox SL 620, 50 mm	 $\alpha_w = 0.85$
3	SeaRox SL 620, 30 + 50 mm	 $\alpha_w = 0.90$
4	SeaRox SL 620, 75 mm	 $\alpha_w = 0.90$
5	SeaRox SL 620 ALU, 75 mm	 $\alpha_w = 0.55$
6	SeaRox SL 740, 50 mm	$\alpha_w = 0.75$
7	SeaRox SL 740, 50 mm + alu foil	$\alpha_w = 0.65$
8	SeaRox SL 320, 50 mm	$\alpha_w = 0.85$
9	SeaRox SL 340, 50 mm	$\alpha_w = 0.90$
10	SeaRox SL 340, 50 mm + 1 mm perf. steel suspended 10 mm	$\alpha_w = 0.90$
11	SeaRox SL 340, 2 x 50 mm	$\alpha_w = 0.95$
12	SeaRox SL 436, 50 mm	$\alpha_w = 0.85$
13	SeaRox SL 440, 50 mm	$\alpha_w = 0.75$
14	SeaRox SL 480, 50 mm	$\alpha_w = 0.75$
15	SeaRox SL 480, 2 x 30 mm	$\alpha_w = 0.80$
16	SeaRox SL 620, 40 mm	$\alpha_w = 0.80$
17	SeaRox SL 620, 40 mm + alu foil	$\alpha_w = 0.50$
18	SeaRox SL 620, 60 mm incl. pin's and washer	$\alpha_w = 0.90$
19	SeaRox SL 620, 60 mm incl. pin's and washer, covered by 19 $\mu$ foil	$\alpha_w = 0.90$
20	SeaRox SL 640, 30 mm	$\alpha_w = 0.70$
21	SeaRox SL 640, 50 mm	$\alpha_w = 0.80$
22	SeaRox SL 640, 2 x 30 mm	$\alpha_w = 0.90$
23	SeaRox SL 640, 30 mm + 30 mm alu + 1 mm perf. steel suspended 10 mm	$\alpha_w = 0.30$
24	SeaRox SL 660, 2 x 50 mm	$\alpha_w = 0.90$
25	SeaRox WM 950, 50 mm	$\alpha_w = 0.90$
26	SeaRox WM 950 ALU, 50 mm	$\alpha_w = 0.75$
27	SeaRox WM 950, 100 mm	$\alpha_w = 0.95$
28	SeaRox WM 950 ALU, 100 mm	$\alpha_w = 0.75$
29	SeaRox WM 620, 45 mm	$\alpha_w = 0.90$
30	SeaRox WM 620, 45 mm + SeaRox Acoustic Foil (19 $\mu$ ) + perf. steel plate (suspended)	$\alpha_w = 0.77$
31	SeaRox WM 620, 2 x 45 mm	$\alpha_w = 0.95$
32	SeaRox WM 640, 30 mm	$\alpha_w = 0.80$
33	SeaRox WM 640, 75 mm	$\alpha_w = 0.90$
34	SeaRox WM 640, 100 mm	$\alpha_w = 0.90$



**Sound reduction**  
is an impression rating  
the reduction of sound  
through a wall or a  
building element from  
one room to the other.



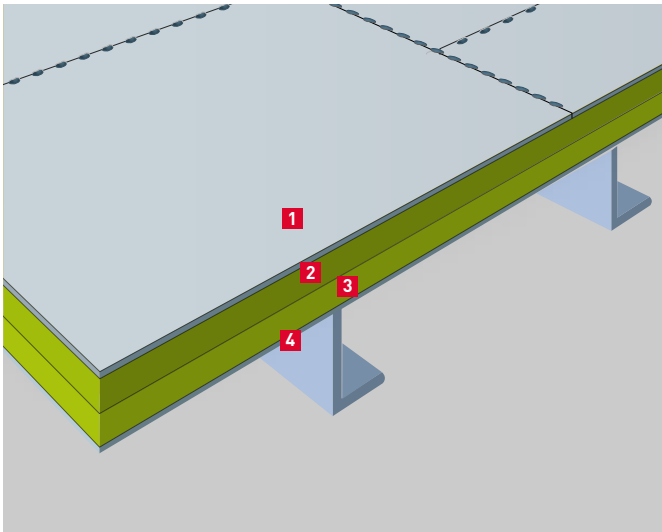
## Overview - reduction measurements

No	Construction	Products	Weighted reduction
1	A-30 steel deck	SeaRox SL 620, 30 mm/ 30 mm	 $R_w = 44$ dB *
2	A-30 steel deck + thermal	SeaRox SL 620, 30 mm/ 30 mm and 50 mm SeaRox MA 720 ALU	 $R_w = 47$ dB *
3	A-60 steel deck/bulkhead restr.	SeaRox SL 620, 50 mm/ 30 mm	 $R_w = 45$ dB *
4	A-60 steel deck/bulkhead restr. + thermal	SeaRox SL 620, 50 mm/ 30 mm and 50 mm SeaRox MA 720 ALU	 $R_w = 48$ dB *
5	A-60 steel bulkhead	SeaRox SL 620, 50 + 30 mm/ 30 mm	 $R_w = 47$ dB *
6	A-60 steel bulkhead + thermal	SeaRox SL 620, 50 + 30 mm/ 30 mm and 50 mm SeaRox MA 720 ALU	 $R_w = 49$ dB *
7	A-60 steel bulkhead	SeaRox SL 620, 75 mm/ 30 mm	 $R_w = 46$ dB *
8	A-60 steel bulkhead + thermal	SeaRox SL 620, 75 mm/ 30 mm and 50 mm SeaRox MA 720 ALU	 $R_w = 49$ dB *
9	A-60 steel bulkhead	SeaRox SL 620, 75 mm/ 30 mm + 19 my SeaRox Acoustic Foil	 $R_w = 46$ dB *
10	A-60 steel bulkhead	SeaRox SL 620 GW 200, 75 mm/ 30 mm with glass cloth 200 g/m <sup>2</sup>	 $R_w = 48$ dB *
11	A-60 steel bulkhead	SeaRox SL 620 ALU, 75 mm/ 30 mm with reinf. alufoil	 $R_w = 46$ dB *
12	A-15 steel deck	SeaRox MA 700 GS <sup>d</sup> , 40 mm	$R_w = 45$ dB **
13	A-30 steel bulkhead/deck	SeaRox SL 740, 50 mm/ 30 mm	$R_w = 45$ dB **
14	A-60 steel bulkhead	SeaRox WM 640, 75 mm/ 30 mm	$R_w = 47$ dB **
15	A-60 steel bulkhead	SeaRox WM 620, 2 x 45 mm/45 mm	$R_w = 49$ dB **
16	A-60 steel bulkhead	SeaRox SL 640, 2 x 30 mm/ 30mm	$R_w = 48$ dB *
17	A-60 steel bulkhead	SeaRox SL 620, 60 mm/ 25 mm	$R_w = 45$ dB *
18	A-60 steel bulkhead	SeaRox SL 640, 2 x30 mm/ 30 mm with 19 $\mu$ SeaRox Acoustic Foil system	$R_w = 47$ dB **
19	A-60 steel bulkhead	SeaRox WM 620, 2 x 45 mm/ 45 mm with 1 mm steel sheet	$R_w = 58$ dB **
20	A-60 steel bulkhead	SeaRox SL 620 GW 200, 60 mm/ 25 mm with glass cloth 200g/m <sup>2</sup> plus tape	$R_w = 45$ dB *
21	A-60 steel bulkhead	SeaRox SL 620 ALU, 60 mm/ 25 mm with reinf. alufoil	$R_w = 46$ dB *
22	A-60 steel deck	SeaRox SL 620, 40 mm/ 25 mm	$R_w = 46$ dB **
23	A-60 steel deck	SeaRox WM 620, 45 mm	$R_w = 46$ dB **
24	A-60 steel deck	SeaRox SL 640, 40 mm with 1mm steel sheet	$R_w = 56$ dB **
25	A-60 aluminium bulkhead	SeaRox SL 620, 2 x 30 mm/ 30 mm (on both sides)	$R_w = 40$ dB
26	A-60 aluminium deck	SeaRox SL 620, 2 x 30 mm/ 30 mm	$R_w = 40$ dB
27	A-60 bulkhead corrugated	SeaRox SL 620, 60 mm	$R_w = 40$ dB
28	A-60 bulkhead corrugated	SeaRox SL 640, 2 x 30 mm	$R_w = 40$ dB
29	H-60 bulkhead restricted	SeaRox SL 660, 30 mm and SeaRox WM 660, 40 mm / 40 mm	$R_w = 48$ dB **
30	H-60 bulkhead restricted + thermal	SeaRox SL 660, 30 mm and SeaRox WM 660, 40 mm / 40 mm and 50 mm SeaRox SL 720	$R_w = 50$ dB **
31	H-60 bulkhead restricted + comfort	SeaRox SL 660, 30 mm and SeaRox WM 660, 40 mm / 40 mm and 50 mm SeaRox MA 720ALU, 50 mm	$R_w = 51$ dB **
32	H-120 bulkhead restricted	SeaRox SL 660, 30 mm and SeaRox WM 660, 40 mm / 2 x 40 mm	$R_w = 49$ dB **
33	H-60 steel deck	SeaRox SL 660, 2 x 50 mm	$R_w = 48$ dB **
34	H-120 bulkhead corrugated	SeaRox SL 660, 50 mm and SeaRox WM 660, 40 mm	$R_w = 44$ dB
35	A-30 bulkhead with panel	SeaRox SL 740, 50/25 mm and 25 mm panel	$R_w = 62$ dB
36	Acoustic solution	SeaRox SL 340, 2 x 50 mm with 5-10 mm air gap	$R_w = 49$ dB **

\* Test specimen 5 mm steel plate

\*\* Test specimen 6 mm steel plate

# Floating Floors and Panels



- 1 Steel Plate 2 mm
- 2 SeaRox SL 480, 30 mm
- 3 SeaRox SL 480, 30 mm
- 4 Steel Deck

## Floating Floors

To obtain a good comfort a good noise reduction is required between the individual decks. To prevent noise – particularly impact sound and structure borne noise – travelling from one cabin to another you must use an insulation solution which has the necessary rigidity, elasticity and noise reduction/absorption. For this purpose ROCKWOOL Technical Insulation has developed and for many years marketed the SeaRox SL 436 (Marine Slab 140) with an excellent track record. This product is widely used by dedicated floating floor companies as the core material, combined with different types of load spreading top layers and base layers.

These solutions are extensively used on cruise liners where stringent requirements are made in order for people to be able to enjoy their cruise without being bothered by noise.

At the same time many of these floating floor constructions are made as approved A-60 Deck Fire Protection Solutions.



## Panels

Throughout the accommodation areas of a vessel or living quarter, it is required to have B-Class fire restriction zones and fire protection between each cabin and at the same time it is needed to have comfort and noise insulation between each cabin towards public areas etc.

For this purpose the SeaRox Slabs range of products has proven to be highly successful.

ROCKWOOL Technical Insulation has with the customers developed a great number of special products possessing high compressive and delaminating strength as well as great fire resistance, which has been approved as non-combustible according to latest IMO regulations.

The panel and door manufacturers hereby have an outstanding core material for the fabrication of sandwich constructions.

# Technical Insulation



## Pipe Insulation

Pipe insulation is rarely visible, but often decisive for the comfort and safety on board. The safety rules of SOLAS (Chp II-2) regarding hot surfaces in engine rooms have to be fulfilled. Pipe insulation is also necessary to reduce the surface temperature on the pipes so that people working in the vicinity are not injured by contact with hot pipes. To prevent corrosion and blockage of pipes for heavy oil, cargo lines for product tankers etc. it can further more be decisive to avoid too great a heat loss from the pipes.

ROCKWOOL Technical Insulation has a wide selection of marine approved solutions for pipe insulation, which satisfy all these requirements, for large pipes as well as small pipes. Ridged pipe sections are available both with and without reinforced aluminium foil covering.

The Pipe Sections are especially suitable for ambient to very high temperatures, but can also be utilised for chilled media. Please see the web site where a calculation application can be downloaded, to determine heat loss, surface temperatures and required thicknesses.

## Air Ducts

Today, many requirements are made on air ducts. Most important is that the comfort on board the vessels or platform living quarters is considered and that no compromises are made to meet the demands on fire safety.

In connection with ventilation of cabins and other rooms it must furthermore be ensured that no condensation is formed and that the required temperature is maintained all the time. This is obtained by using one of the ROCKWOOL Technical Insulation SeaRox products.



### Typical ROCKWOOL products for technical installations

SeaRox WM 950

SeaRox LM 900 ALU

SeaRox SL 970

ProRox PS 960/ ProRox PS 960 ALU

## Technical Installations

For a large range of technical equipment on board a vessel or offshore installation, there will be requirements for insulation. This will often be a combination of thermal control, noise reduction and fire safety. For these purposes ROCKWOOL Technical Insulation will be able to supply a perfect solution. Also for odd size and shape installations.

*Products for technical installations are covered by our range of thermal insulation products - see product overview page 23.*

# Facings and Accessories



## Facings

There are many reasons for choosing insulation products with facings. It is generally done to obtain a vapour barrier, which prevents formation of condensation on the cold side of a construction.

ROCKWOOL Technical Insulation can for this purpose offer a number of products faced with a reinforced alu foil, which ensures a strong surface. In addition to this, we can provide products with a glass fabric, which often provides a cheaper and lighter construction. These products are typically used for car decks, air-conditioning, plants, engine rooms, lift shafts or the like. ROCKWOOL Technical Insulation also offers products with glass tissue typically used for sound reduction or insulation of ventilation ducts.



## Accessories

Accessories for the installation work are also available from ROCKWOOL Technical Insulation.

**The product range covers e.g.**

- Aluminium tape.
- Glass fabric, white 210 gr/m<sup>2</sup>.
- Adhesive for glass fabric.
- 1" galvanised wire mesh.



# Product Selector

ROCKWOOL Technical Insulation has developed a special range of marine products, which meets the requirements of IMO's regulation at any time. For every construction there is consequently a ROCKWOOL SeaRox product that has the required approval.

The below table gives a general idea of the applications of the products in different constructions.

		SeaRox MA 700 GS/ALU <sup>d</sup>	SeaRox SL 720/MA 720 ALU	SeaRox SL 740*/MA 740 ALU	SeaRox SL 320	SeaRox SL 340	SeaRox SL 440/SL 480	SeaRox SL 436/SL 480	SeaRox SL 620	SeaRox SL 640	SeaRox SL 970	SeaRox WM 660	SeaRox SL 660	SeaRox LM 900 ALU	SeaRox WM 950/WM 620/WM 640	ProRox PS 960/PS 960 ALU
<b>Bulkhead and Deck</b>																
<b>A constructions</b>	Fire	•		•				•	•	•					•	
<b>H constructions</b>	Fire											•	•			
<b>Comfort</b>		•	•	•	•	•										
<b>Floating floors</b>							•	•								
<b>Pipes</b>	< 250 °C													•		•
	> 250 °C														•	•
<b>Tanks</b>	< 250 °C			•										•		
	> 250 °C										•				•	
<b>Air ducts</b>	Fire										•				•	
	Comfort insulation						•							•		
<b>Exhaust pipes</b>															•	





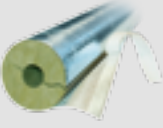
\* Fire, only SeaRox SL 740

# Product Overview





	Product	Thickness mm	Length mm	Width mm	Application
  <b>Comfort Insulation</b>	SeaRox MA 700 GS <sup>d</sup>	50	5000	1000	Lightweight and soft resilient roll made of stone wool. The product is delivered with a 10 mm glass scrim. Used for comfort insulation and A-15.
	SeaRox SL 720	50, 100	1000	600	Lightweight and semi-rigid slab for comfort insulation. Can be supplied with reinforced alu on 1 side.
	SeaRox SL 720 ALU	50			
	SeaRox MA 720 ALU	50, 100	4000	1000	Lightweight and highly compressed roll used for comfort insulation. Supplied with reinforced alu on 1 side.
	SeaRox SL 740	25-100	1000	600	Lightweight and semi-rigid slab for comfort insulation. Can be supplied with reinforced alu or white glass cloth on 1 side. Approved for A-30 constructions.
	SeaRox SL 740 ALU	25-100			
SeaRox SL 740 GW 200	30, 50				
SeaRox MA 740 ALU	50	3000	1000	Semi-rigid compressed roll used for comfort insulation. Supplied with reinforced alu on 1 side.	
 <b>Acoustic</b>	SeaRox SL 320	50, 75	1000	600	Semi-rigid slab for e.g. sound insulation.
	SeaRox SL 340	30-100	1000	600	Semi-rigid slab for e.g. sound insulation, can be supplied with reinforced alu or black tissue on 1 side.
	SeaRox SL 340 ALU	50			
SeaRox SL 340 TB	25,50				
	SeaRox Acoustic Foil			1000	Thin, strong and durable film for e.g. engine rooms
 <b>Outfitting</b>	SeaRox SL 436	30, 40, 50, 60	1000	600	Rigid slab for insulation of floating floors only. Approved for A-60 floating floor.
	SeaRox SL 440	50, 100	1000	600	Strong and rigid slabs for e.g. floating floor or to be cut into lamellas and used for panels.
	SeaRox SL 470	25	1000	600	Strong and rigid slabs for e.g. B15 Extension or panels.
	SeaRox SL 480	30, 50	1000	600	Strong and rigid slabs for e.g. floating decks or to be cut into lamellas and used for panels. Approved for A-60 Floating floor.
 <b>Firesafe Insulation</b>	SeaRox SL 620	25-75	1000	600	Rigid slab for fire insulation in approved A-constructions. Can be supplied with reinforced alu or white glass cloth on 1 side.
	SeaRox SL 620 ALU	25-75			
SeaRox SL 620 GW 200	25-75				
	SeaRox SL 640	30, 40, 50	1000	600	Rigid slab for fire insulation in approved A-constructions. Can be supplied with reinforced alu or white glass cloth on 1 side.
SeaRox SL 640 ALU	30, 40, 50				
SeaRox SL 640 GW 200	30, 40, 50				

*Local variations in products and dimensions might occur.*

Firesafe Insulation

Product	Thickness mm	Length mm	Width mm	Application
 SeaRox SL 660 SeaRox SL 660 ALU	30, 50	1000	600	Special product used for insulation of H-constructions. Can be supplied with reinforced alu on 1 side.
 SeaRox WM 660 SeaRox WM 660 ALU	40	4000	500	Flexible mat, one side faced with wire netting. Special product used for insulation of H-constructions. Can be supplied with reinforced alu on 1 side.
 SeaRox WM 620 SeaRox WM 620 ALU	30, 45, 50 45	2-7000	1000	Flexible Mat, one side faced with wire netting. Used for approved A-constructions and penetrations. Can be delivered with reinforced alu on 1 side
 SeaRox WM 640 SeaRox WM 640 ALU	30, 50, 75	2-7000	1000	Flexible Mat, one side faced with wire netting. Used for approved A-constructions and penetrations. Can be delivered with reinforced alu on 1 side
 SeaRox PS 620	40	1000	22-60	Pipe Section specially developed for fire protection of sprinkler pipes

Thermal Insulation

 SeaRox SL 970	50	1000	600	Rigid slab for high temperatures insulation
 SeaRox WM 950 SeaRox WM 950 ALU	50, 80 50, 80	2-4000	1000	Flexible Mat, one side faced with wire netting. Used for technical installations mainly pipes. Can be delivered with reinforced alu on 1 side
 SeaRox LM 900 ALU	30	8/10000	1000	Lamellas placed edgewise on alu (roll). For insulation of pipes, tanks and ventilation ducts.
 ProRox PS 960 ProRox PS 960 ALU	20-100	1000	17-356	Rigid Pipe Sections for steam and process pipes. Can be delivered with reinforced alu and self adhesive tape.

**Accessories:**  
Alu tape, glass fabric and wire mesh

*Local variations in products and dimensions might occur.*

**Firesafe Insulation**

Products mainly for fire rated constructions

**Thermal Insulation**

Products mainly for thermal insulation of technical installations.

# ROCKWOOL Technical Insulation

ROCKWOOL Technical Insulation, an independent organisation of the international ROCKWOOL Group, is the world wide market leader in technical insulation. With our two product lines, ProRox and SeaRox, we cover the whole industrial market and marine & offshore industry, providing a full range of products and systems for the thermal and firesafe insulation of technical applications. Besides sustainable products we offer reliable expert advice, from documentation to delivery and after sales service. Throughout the whole chain from specifier, through dealer to contractor and installer we aim to add value. We don't just sell products, we supply solutions. It's this total approach that makes us the ideal choice for professionalism, innovation and trust.

All explanations correspond to our current range of knowledge and are therefore up-to-date. The examples of use outlined in this document serve only to provide a better description and do not take special circumstances of specific cases into account. ROCKWOOL Technical Insulation places great value upon continuous development of products, to the extent that we too continuously work to improve our products without prior notice. We therefore recommend that you use the most recent edition of our publications, as our wealth of experience and knowledge is always growing. Should you require related information for your specific application or have any technical queries, please contact our sales department or visit our website [www.rockwool-rti.com](http://www.rockwool-rti.com)

## The ROCKWOOL Group

The ROCKWOOL Group is the world's leading supplier of innovative products and systems based on stone wool, improving the environment and the quality of life for millions of people. The Group is amongst the global leaders within the insulation industry. Together with other building-related products such as acoustic ceilings, cladding boards and our consultancy business, the Group ensures energy efficient and firesafe buildings with good acoustics and a comfortable indoor climate. We create green solutions for the horticultural industry, inventive special fibres for industrial use, effective insulation for the process industry and marine and offshore as well as noise and vibration systems for modern infrastructure.

Our more than 11 000 employees in more than 35 countries cater for customers all over the world. The Group's head office is located close to Copenhagen. In 2014 the Group generated sales of almost EUR 2,18 billion. The company is listed on the NASDAQ OMX Nordic Exchange Copenhagen. The Group's operations have a main presence in Europe and we are expanding production, sales and service activities in North and South America and Asia. Together with a broad network of business partners, this ensures that the Group's products and systems reach almost every corner of the globe. For more information, please visit [www.rockwool.com](http://www.rockwool.com)

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**TECHNICAL INSULATION**

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