Vacutherm
Vacuum Insulation Panels

POREXTHERM

Vacupor® PS

Vacuum-Insulation-Panel (VIP) with polystyrene protection

Characteristics

Vacupor® PS is a microporous insulation material with an extremely low coefficient of thermal conductivity, i.e. with very good insulating properties.
Vacupor® PS consists of inorganic oxides. The main constituent is fumed silica, the other components are opacifiers for minimizing infrared radiation, and silicates.

Vacupor® PS (core material) is not flammable and meets the requirements of IMO FTPC part 1 and DIN ISO 4102 part 1, A1.
Vacupor® PS is heat sealed in a barrier film under vacuum. The very low internal pressure and the microporous panel core is responsible for the extremely low thermal conductivity values.

Application

Vacupor® PS was specially developed for applications in vacuum insulation technology. The low density and the specially developed IR opacifiers contained in these grades greatly reduce the thermal conductivity of Vacupor® PS Systems.
Due to the single- or double-sided coverage with polystyrene sheets, Vacupor® PS is excellently suitable for all kinds of wall and floor layings.
The fixing of the insulation is substantially facilitated, through the possibility of bonding with commercial polystyrene adhesives.
Vacupor® PS is offered in two versions:

- Vacupor® PS 10/10, 10mm thick coating on both sides
- Vacupor® PS 10/20 with 10 mm and 20 mm coating for the use as an EWIS.

Vacupor® PS offers different advantages, like e.g.:

- Increase of the heat support ability
- Decrease of weight and insulation volume
- Decrease of the land consumption

Vacupor® PS is also successfully used as insulation material in the following areas:

- External Wall Insulation Systems (EWIS)
- Reveal insulation
- Insulation of basement ceilings

Form of delivery

1. Standard sizes:

- 1200 mm * 1000 mm * **X**
- 1000 mm * 600 mm * **X**
- 1200 mm * 500 mm * **X**
- 600 mm * 500 mm * **X**
- 1000 mm * 300 mm * **X**
- 300 mm * 250 mm * **X**
- 600 mm * 250 mm * **X**

2. Standard thicknesses (without protection):

- 10 mm, 15 mm, 20 mm, 25 mm, 30 mm
- Further thicknesses on request

3. Special formats available on request

Restrictions on Applications

The laminated aluminum foil of the Vacupor® PS must not be damaged by drilling, cutting, milling, nailing or the like, since the interior pressure of the panel will rise and the special properties of the panel, in particular its excellent insulation characteristics, will be lost.

Shelf life

Vacupor® PS has a very long shelf life. Please also observe our pressure rise table: Thermal conductivity as a function of interior pressure.

Composition

Silicon dioxide	SiO2	approx. 80%
Silicium carbide	SiC	approx. 15%
Others		approx. 5%

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Product data

Properties (applicable to standard format)	Comments	Standards	Units	Values
Color	Caused by film / coverage			Silver / White
Density [1]			kg / m^3	150-300
Thermal conductivity [2] @ 1 mbar [3]	Measured at 22,5 °C (72.5 °F) mean temperature	DIN 52612	W / (m×K)	≤ 0,005
@ ambient pressure			W / (m×K)	≤ 0,019

U-Value

W / (m^2K)

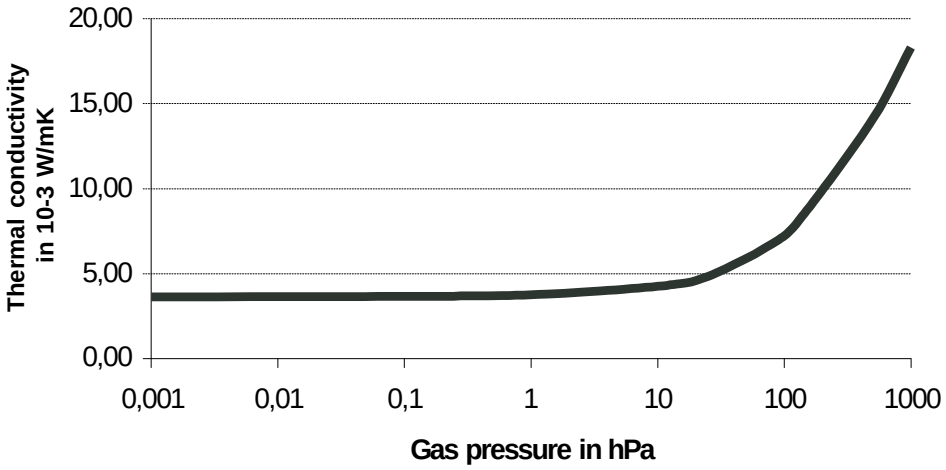
	Thickness VIP [mm]		
	10	20	30
Vacupor PS 10/10	0,40	0,23	0,16
Vacupor PS 10/20	0,36	0,21	0,15

Heat resistance [4]	Caused by film weld seam	°C	-50 <T< 120
Maximum film projection		mm	0
Interior pressure [3]	As delivered	mbar	≤ 5
Theoretical pressure rise	Under standard conditions	mbar / a	0,5
Maximum panel dimensions	Length	mm	150 - 2200
	Breadth	mm	150 - 1000
	Thickness	mm	10 - 50
Length and width tolerances	0 bis 500 mm	mm	+ 1,0 / - 2,0
	501 bis 1000 mm	mm	+ 1,0 / - 4,0
	> 1000	mm	+ 1,0 / - 6,0
Thickness tolerances	< 20 mm	mm	± 1,0
	20 mm bis 30 mm	mm	+ 1,0 / - 2,0
	> 30 mm	mm	+ 1,0 / - 3,0
Thermal shock resistance	Vacupor® PS (core material) is insensitive to high and low temperature thermal shocks		

[1] Dependent on board thickness
[2] Only applicable for Vacupor® NT without coverage
[3] Dependent on the panel-size and –thickness, internal pressure can be between 0.5 – 5 mbar. The standard internal pressure in the evacuation chamber is < 0.5 mbar.
[4] The limits are fixed by the barrier film (sealing material) used; constant load: ≤ 80°C (176°F); short load time with 120°C (248°F): roughly 30 minutes.

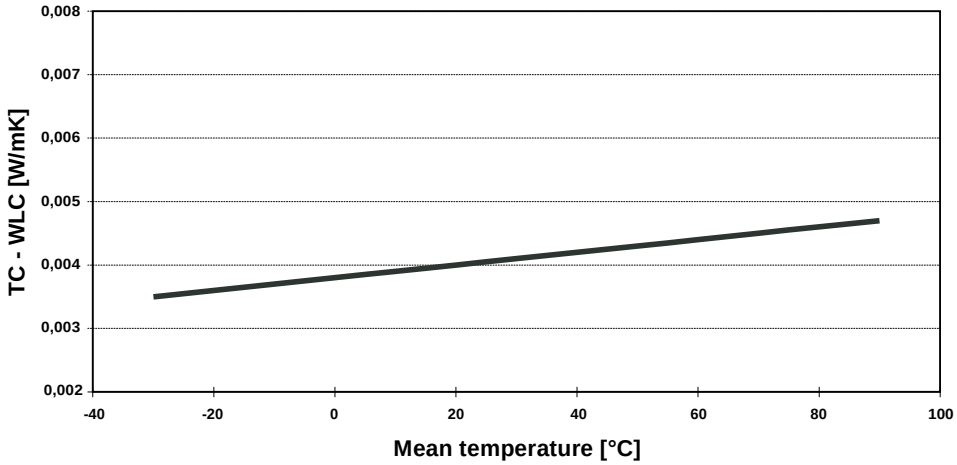
The above data are only intended as a guide and should not be used in preparing specifications.

Thermal conductivity as a function of internal pressure (DIN 52612)

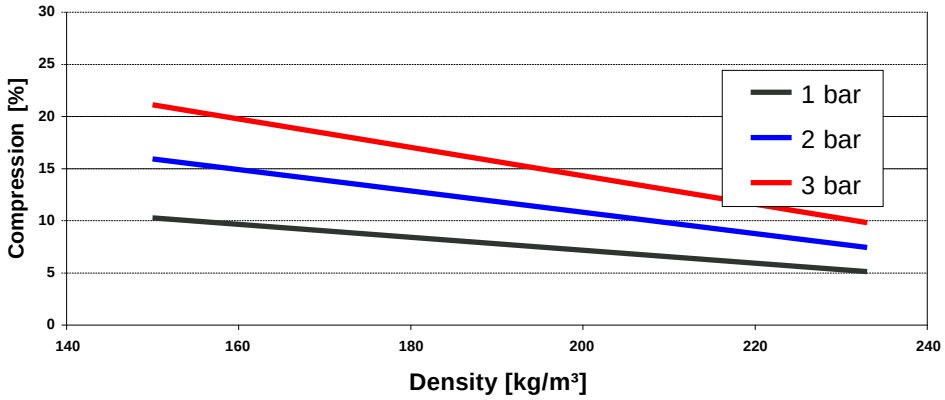


gas pressure p_{gas}	U- Value	λ
[hPa]	[W/(m²K)]	[10^{-3} W/(mK)]
< 10^{-3}	0.187	3.63
0.1	0.188	3.66
1.0	0.193	3.75
10	0.219	4.25
150	0.448	8.70
1000	0.943	18.30

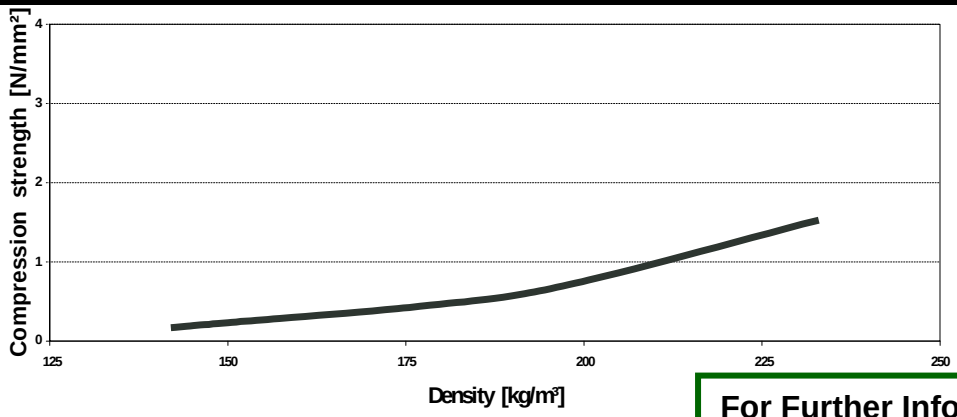
Thermal conductivity (panel core) DIN 52612



Compression behavior (panel core)



Low-temp. Compression strength (panel core)



Safety directions

Vacupor® PS is not a hazardous material as defined in EU directive 2006/1907/EEC.
Please also observe our material safety data sheet.
Vacupor® PS does not liberate hazardous decomposition products and, as far as is known at present, does not cause any problems to human health or the environment.

For Further Information Contact:

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