

Technical Data Sheet va-Q-pro



Product Description

In addition to an outstanding thermal conductivity of 0.0035 W/mK, the va-Q-pro features two- and three dimensional free forms of Vacuum Insulation Panels (VIPs). In combination with the automated manufacturing process, these free forms are unique on the market. The va-Q-pro technology has enormous flexibility when it comes to panel design, with a multitude of variations available including circular shapes, angled 3D formats, folding boxes, cut-outs, and passthroughs. When combined with conventional rectangular VIPs, such as va-Q-plus, these technologies can provide energy-efficient high-performance insulation even where application circumstances are complex. Specific examples include the insulation of vehicles, aircraft, refrigeration units, machinery systems, thermal boxes, and hot water tanks.

Features

- Achieving the highest energy efficiency classes by reducing energy losses
- Maximization of VIP surface coverage through customized design
- Exceptional insulation performance due to thermal conductivity λ (10 °C) of ≤ 0.0035 W/mK
- Without any product or process changes on the part of the client
- Customized development of tailor-made solutions through holistic consulting (simulations, test center, etc.)

Properties

Thermal conductivity - initial value @ 10 °C*	≤ 0.0035 W/(m·K) (at delivery) according to DIN EN 12667
Thermal conductivity, ventilated @ 10 °C*	0.020 W/(m·K) according to DIN EN 12667
U-Value - initial value @ 10 °C*	0.35 W/(m ² ·K) (thickness = 10 mm)
Internal gas pressure @ 20 °C	< 7 mbar (at delivery)
Density	165 – 230 kg/m ³ according to DIN EN 1602
Area density	1.65 – 2.3 kg/m ² (thickness = 10 mm)
Temperature resistance	-75 – 100 °C (temporary up to 130 °C)**
Thermal shock resistance	-75 – 80 °C according to DIN EN 60068-2-14 0 – 110 °C according to DIN EN 60068-2-14
Moisture resistance	0 – 70 % rel. humidity (until 50 °C)
Specific heat capacity	0.8 kJ/(kg·K) (at room temperature)
Compressive strength at 10 % compression	≥ 120 kPa according to DIN EN 826
Lifetime	Depending on usage, up to 60 years

*Please note terms of service § 6 “Deviation range of the insulation value” in “Special Terms and Conditions of Sale and Delivery, Product: Vacuum Insulation Panels (VIPs)” corresponding to the valid version respectively.

**lower and higher application temperatures are possible on request. Please contact us for details.

Testing Standards

Our va-Q-pro panels are subjected to the according to internal test methods to confirm their exceptional properties:

- Long-time performance tests up to 160 °C
- Accelerated aging tests at 50 °C, 70 % relative humidity and 80 °C (dry)
- Long-time monitoring at room conditions (p(t), λ(t))
- Thermal conductivity measurements λ(T), λ(p) according to DIN EN 12667
- Thermal shock resistance according to DIN EN 60068-2-14

Measures and tolerances

length l in [mm]	width w in [mm]			width w in [mm]			width w in [mm]					
	≤ 300			> 300 - 500			> 500					
	thickness t in [mm]	tolerances: l/w/t in [mm]		thickness t in [mm]	tolerances: l/w/t in [mm]		thickness t in [mm]	tolerances: l/w/t in [mm]				
≤ 500	≤ 10	+2/-4	+2/-3	+2/-1,5	≤ 10	+2/-4	+3/-4	+2/-1,5	≤ 10	+2/-4	+3/-6	+2/-1,5
	> 10 - 15	+3/-4	+2/-4	+2/-2	> 10 - 15	+3/-4	+3/-5	+2/-2	> 10 - 15	+3/-4	+3/-7	+2/-2
	> 15	+4/-4	+3/-4	+2,5/-2,5	> 15	+4/-4	+4/-7	+2,5/-2,5	> 15	+4/-4	+5/-10	+2,5/-2,5
> 500 - 1000	≤ 10	+4/-5	+2/-3	+2/-1,5	≤ 10	+4/-5	+3/-4	+2/-1,5	≤ 10	+4/-5	+3/-6	+2/-1,5
	> 10 - 15	+4/-7	+2/-4	+2/-2	> 10 - 15	+4/-7	+3/-5	+2/-2	> 10 - 15	+4/-7	+3/-7	+2/-2
	> 15	+5/-10	+3/-4	+2,5/-2,5	> 15	+5/-10	+4/-7	+2,5/-2,5	> 15	+5/-10	+5/-10	+2,5/-2,5
> 1000 - 1500	≤ 10	+5/-7	+2/-3	+2/-1,5	≤ 10	+5/-7	+3/-4	+2/-1,5	≤ 10	+5/-7	+3/-6	+2/-1,5
	> 10 - 15	+7/-10	+2/-4	+2/-2	> 10 - 15	+7/-10	+3/-5	+2/-2	> 10 - 15	+7/-10	+3/-7	+2/-2
	> 15	+10/-15	+3/-4	+2,5/-2,5	> 15	+10/-15	+4/-7	+2,5/-2,5	> 15	+10/-15	+5/-10	+2,5/-2,5
> 1500	≤ 10	+7/-10	+2/-3	+2/-1,5	≤ 10	+7/-10	+3/-4	+2/-1,5	≤ 10	+7/-10	+3/-6	+2/-1,5
	> 10 - 15	+10/-15	+2/-4	+2/-2	> 10 - 15	+10/-15	+3/-5	+2/-2	> 10 - 15	+10/-15	+3/-7	+2/-2
	> 15	+20/-20	+3/-4	+2,5/-2,5	> 15	+20/-20	+4/-7	+2,5/-2,5	> 15	+20/-20	+5/-10	+2,5/-2,5

Remark: Based on the unique production method, the panels are less thick at the edges and corners than in the center. The measures, tolerances and insulation values refer to the insulated area of the panel from one corner to another. Circulating the panel there is a 10 mm to 30 mm wide sealing seam. A typical panel measures 5 mm up to 16 mm. The smaller the panel the slighter is the maximal thickness of the panel due to production limits. **Please ask for your wished dimensions.**

Flaps	Measure	Tolerance
Width of flaps	20 mm	+0/-10 mm

Remark: The laying and fixing of the flaps plus other refinements, e.g. laminations, are possible on request.

Legal Notes/Disclaimer

The data presented in this technical data sheet are in accordance with the present state of our knowledge.

All numbers and features proposed in this data sheet (e.g. lifetime) were determined under test conditions in the laboratory and therefore represent a nonbinding and purely scientific value. There are no guarantees associated with. Only the respectively agreed warranty period and warranty rights apply.

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