va-Q-tec Thermal Solutions GmbH
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WE SOLVE THERMAL CHALLENGES

Technical Product Datasheet
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 circum-stances 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 $\leq$ 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.)

7th of February 2023

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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/(m²·K) (thickness = 10 mm)**
Internal gas pressure @ 20 °C	**< 7 mbar (at delivery)**
Density	**165 – 230 kg/m³ according to DIN EN 1602**
Area density	**1.65 – 2.3 kg/m² (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

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Measures and Tolerances

	width w in [mm]				width w in [mm]				width w in [mm]			
length l 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 form 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.

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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.

To the extent permitted by law, all other warranties of any kind, whether express or implied, including, but not limited to the implied warranties of MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, and non-infringement are EXCLUDED.

Proposals for usage and applications do not constitute a guarantee, warranty or representation of suitability for the specific purpose. However the user bears the responsibility if the product is suitable and compatible for his own purposes. The user shall perform his own tests and experiments for his individual purposes and applications regarding the suitability and processing of the product described herein.

We reserve the right to change the product values and features. The respective current valid version of this technical data sheet applies and is published on our homepage.

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