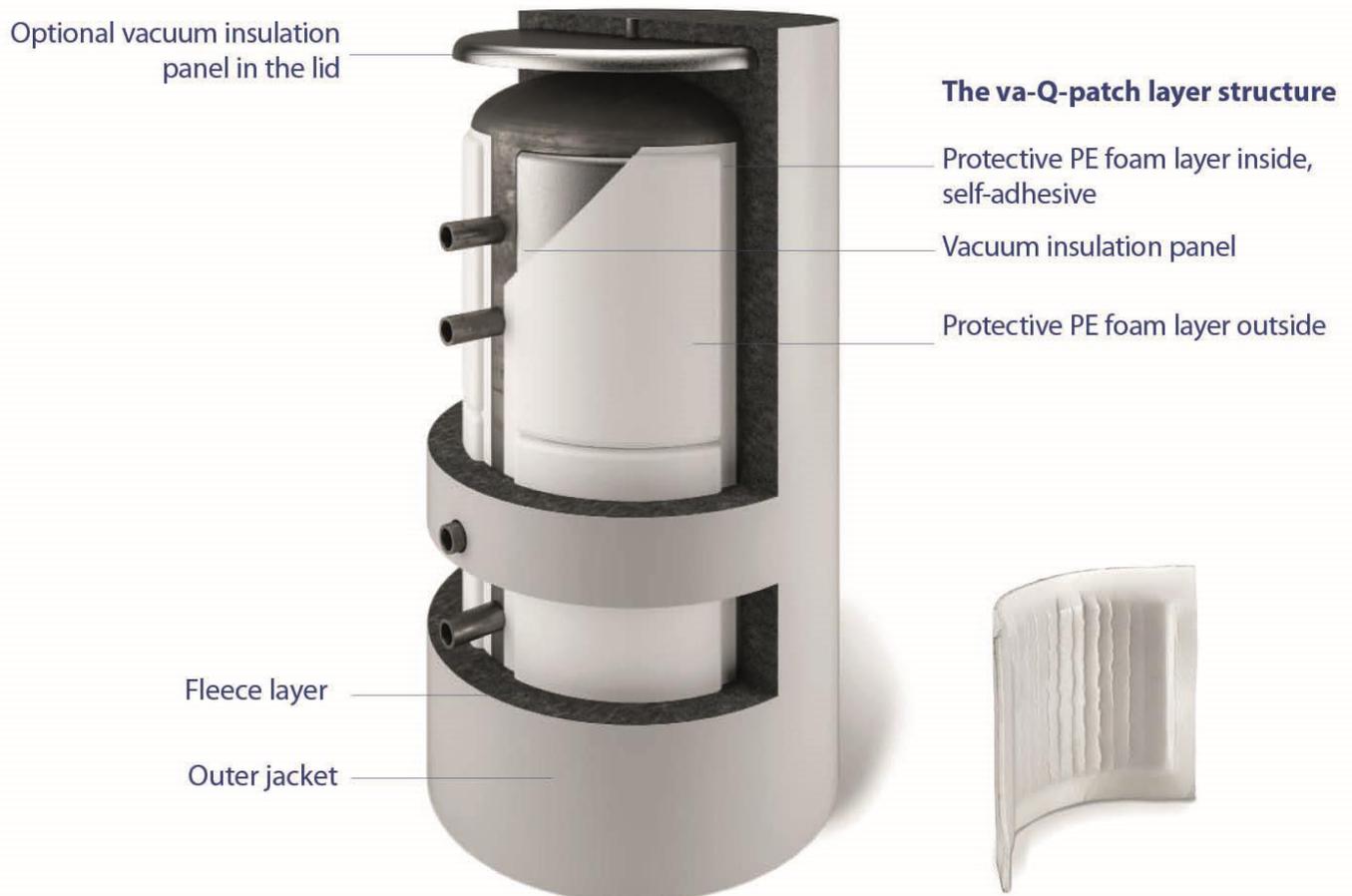


Product Data Sheet va-Q-patch



DESCRIPTION

va-Q-patch is a thermal insulation system consisting of a vacuum insulation panel (VIP) covered on both sides with a full surface polyethylene (PE) foam lamination. It is primarily used as a high-performance insulation layer for heat storage tanks to increase their energy efficiency to a label rating of A and A+ according to the EU regulation 812/2013. The standard configuration includes a thin and adhesive PE foam lamination on the tank side to protect the VIP against welding defects and metal shavings amongst other impacts and to ensure a perfect connection to the tank. va-Q-patch is delivered in a space-saving, flat state and can then be bent around the tank at the installation site. It can be used as an additional layer such as beneath an ordinary polyester fleece insulation.

TECHNICAL PROPERTIES

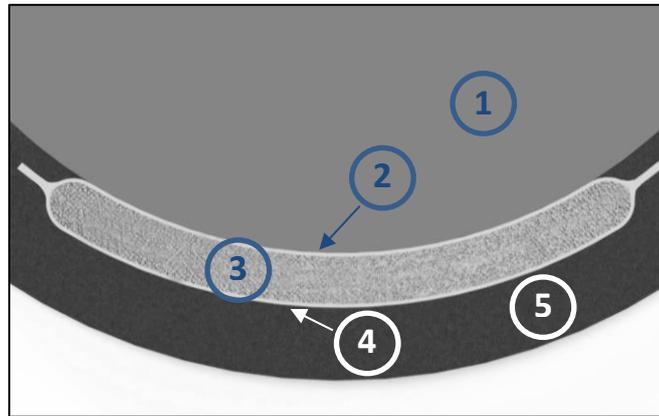


Figure: Cross-section of an installed va-Q-patch. Layer structure from the inside to the outside: tank (1), adhesive PE foam (2), vacuum insulation panel (3), PE foam (4), ordinary polyester fleece insulation (5).

Standard properties are as listed below. Different dimensions or properties are available on request.

Property	Value	Tolerance
Length (min. – max.)		
- VIP	250 mm – 1,900 mm	see va-Q-plus data sheet
- Total	350 mm – 2,000 mm	± 20 mm
Width (min. – max.)		
- VIP	200 mm – 850 mm	see va-Q-plus data sheet
- Total	300 mm – 950 mm	± 20 mm
Thickness (min. – max.) ¹		
- VIP	8 mm – 30 mm (center)	see va-Q-plus data sheet
- Total	12 mm – 34 mm (center)	± 4 mm
Density		
- VIP	see va-Q-plus data sheet	see va-Q-plus data sheet
- PE foam	30 kg/m ³	± 5 kg/m ³
Thermal Conductivity VIP ²	max. 0.0035 W/(m*K)	---
Operating Temperature	up to +95 °C	---
Operating Relative Humidity	0 - 60 %	---

¹ The thickness profile is generally not constant, but thicker at the VIP position and thinner at the surrounding PE foam flaps.

² following DIN EN 12667 at 10 °C and at delivery.

PERFORMANCE EXAMPLE

va-Q-patch is adapted and produced individually according to customer requests. U-values and heat loss is case dependent and calculated accordingly. Support for calculations is available on request. The following section provides an **exemplary comparison** of a pure polyester fleece insulation and an insulation including va-Q-patch:

Tank Specifications	
Storage Volume	1000 l
Diameter	790 mm
Tank Height	1,850 mm
Tank Material	steel
Average Operating Temperature	65° C
Connectors	5 x ½ "
	6 x 1 "
	10 x 1 ½ " arranged vertically

The energy efficiency rating of class A according to the EU regulation 812/2013 could be reached using **four va-Q-patch** with dimensions of **about 1,700 x 700 x 26 mm³** for the mantle surface and an optional **circular va-Q-pro** panel for the lid surface with a **diameter of 750 mm and a thickness of 15 mm**. A calculation including thermal bridge effects caused by connectors and joints results in the following performance:

	va-Q-patch + polyester fleece	pure polyester fleece
Energy Label Reached (acc. EU 812/2013)	A	C
Insulation Thickness	100 mm	100 mm
Thickness of integrated VIP	22 mm	---
Weight per va-Q-patch	approx. 5 kg	---
Minimal U-Value	0.12 W/(m ² *K)	0.40 W/(m ² *K)
Total Heat Loss Rate	1.6 kWh/d	2.9 kWh/d
Potential savings compared to a conventional insulation	475 kWh / year resp. 142,50 € / year ³	---

³Based on an assumed energy price of 0,30 € per kWh.

SAFETY INFORMATION

va-Q-patch is an article according to the REACH regulation (EC) No. 1907/2006 and the OSHA Hazard Communication Standard, 29 CFR Subpart 1910.1200(c). For articles, the preparation of a safety data sheet is not required. Even though this article is not subjected to any obligation to classify or label according to CLP regulation (EC) No. 1272/2008, the va-Q-tec AG provides a safety data sheet for the core material of va-Q-patch on request.

Furthermore, the article contains no Substances of Very High Concern (SVHC) above the threshold 0.1% w/w.

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 these values. 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 noninfringement 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.

It is prohibited to copy or use information from this technical data sheet in whole or in parts, especially towards third parties.

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