



WE SOLVE THERMAL CHALLENGES



# Food

Innovative Solutions for Food Transportation without Dry Ice & Electricity

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EU Ecolabel: DE/053/004

Please collect used paper for recycling.

By producing our brochure in accordance with the provisions of EU Ecolabel, we emphasize our claim for sustainability. The EU Ecolabel is awarded to products and services that have a lower environmental impact

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Our *bonitasprint* print shop uses low-pollution consumables in all printing processes and prints completely alcohol-free. Workflows and processes are constantly optimized in order to make the entire production process as sustainable as possible.

Renewable raw materials

are the basis for organic printing inks and organic varnishes, which are used in our brochure.



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The *bonitasprint* company building is powered by electricity from 100% renewable energy sources. For this purpose, the company operates its own photovoltaic

system. The waste heat from the printing machines and compressors is used to supply heat to the company building. Additional heating is obtained from climate-neutral natural gas with emission compensation.

*bonitasprint* has a continuous in-house production chain. The company's own fleet includes electric and natural gas vehicles. This prevents transport-related CO<sub>2</sub> emissions. The climate neutrality of these va-Q-tec printed products is also demonstrated by the "climate-neutral printing" logo.

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# Content

<b>About va-Q-tec</b>	4
<b>Technology &amp; Applications in the Food Sector</b>	6
<b>Products for the Food Sector</b>	8
<b>Bakery</b>	
Market & Benefits	10
Products & Specifications	12
Case Studies	16
Individual Solutions	18
<b>E-Grocery</b>	
Market & Benefits	20
Products & Specifications	22
Comparison of different Passive Solutions	24
Case Study	26
Individual Solutions	28
Consultation & Implementation	30



## About va-Q-tec

va-Q-tec is a pioneer of sophisticated solutions for thermal energy efficiency as well as temperature-controlled supply chains. The company develops, manufactures and sells thin, highly efficient Vacuum Insulation Panels (“VIPs”) for thermal insulation as well as intelligent Phase Change Materials (“PCMs”) for reliable temperature control.

Through the targeted combination of VIPs and PCMs, va-Q-tec manufactures thermal packaging systems (boxes) that maintain constant temperatures for food and pharmaceuticals for up to five days during transportation without an external energy supply. In addition, VIPs and PCMs optimize the energy footprints of various applications, such as buildings, hot water storage tanks, local and district heating pipes as well as household appliances and laboratory equipment.

The products of va-Q-tec enable a global improvement in thermal energy efficiency and thus make a valuable contribution to climate protection. The company has been operating climate-neutral at all locations since 2021. Permanent process optimizations minimize the CO<sub>2</sub> footprint.

The company was founded in 2001, and has its headquarters in Würzburg.

### We live Quality

Dr. Joachim Kuhn and Dr. Roland Caps, the founders and inventors of the technology, characterized the “Q” in the company name, which continues to stand for highest quality today. The “Q” is visible, measurable and firmly anchored in all processes of va-Q-tec – quality is the foundation on which the company is built on.



As an established **premium supplier**, we enable our customers to optimize their products ecologically and economically with targeted solutions by saving valuable energy or **dispensing with external energy sources**.



va-Q-tec is a **pioneer** in vacuum insulation technology and has more than **100 international IP rights** and applications. More than **70 international awards** confirm the leading role of the company in the industry.



va-Q-tec promotes resource-conserving and **CO<sub>2</sub>-neutral production** and generates 1.7 million kWh annually from renewable energies, which underlines its **sustainable focus**.



Using strict quality controls, we enable **highest product quality** and offer exceptional **longevity, reliability** and **safety**.



# Technology & Applications in the Food Sector

va-Q-tec offers high-tech reusable boxes with highly efficient vacuum insulation for various sectors of the food industry. The technology can be complemented with special Phase Change Materials which set the temperature inside the box. This technology enables optimal freshness of the food, makes a valuable contribution to a reliable cold chain, and maintains the quality of the products – completely without external energy source. Depending on the product category, the boxes are also characterized by their easy cleaning, stackability, food safety and simple handling.



## Bakery

The innovative insulation of our solutions enables a constant temperature without additional cooling means and, as a result, an optimal cold chain of refrigerated as well as frozen pastries up to the store without refrigerated vehicles.



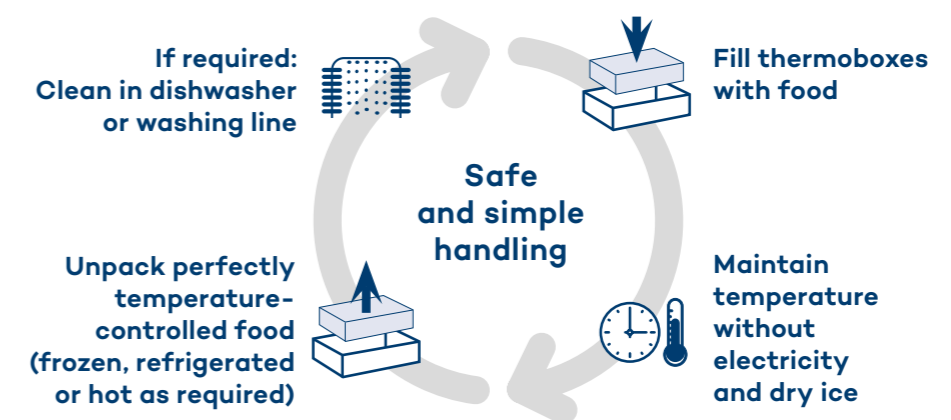
## E-Grocery

In the E-Grocery sector, our thermoboxes enable the safe, profitable and sustainable delivery of refrigerated or frozen groceries without the use of refrigerated vehicles or dry ice.



## Hotel / Restaurant / Catering

Our solutions also enable the safe transportation of food between suppliers and gastronomic businesses or event locations, while the temperature – whether warm or cold – and the quality of the products is maintained at all times without actively keeping them cool or warm.



The use of our reusable thermoboxes minimizes the handling effort and offers a sustainable solution completely without additional energy sources.

The cycle for safe and efficient handling is simple: Pre-refrigerated food is packed into the thermoboxes, which maintain a constant temperature for 3 to 48 hours thanks to innovative Vacuum Insulation Panels (VIPs) and, if necessary, supplemented by Phase Change Materials (PCMs). After delivery, the food is at the ideal temperature – frozen, refrigerated or hot, as required. The boxes can be easily cleaned in the dishwasher or washing line.



## Products for the Food Sector

The shipping and transportation of food is a central component in almost all sectors of retail, where it is crucial to deliver products cost-efficiently, safely and at the right temperature. va-Q-tec offers tailor-made solutions that are precisely adapted to these requirements of modern food transportation.

Our passive, energy-efficient reusable packaging solutions do not require any power supply and therefore no active refrigerated vehicles and protect your products from temperature fluctuations, minimizing spoilage and loss. At the same time, our high-tech solutions ensure that the legal requirements for the cold chain are met throughout the entire transportation process.



**Cost savings by dispensing with active refrigerated vehicles and dry ice**



**Self-sufficient systems with a temperature holding time of up to 48 hours without external energy source**



**Robust & sustainable reusable systems**



**Tailor-made solutions possible**



### va-Q-tray & va-Q-lid

The va-Q-trays and va-Q-lids have been developed specifically for the transportation of deep frozen and refrigerated food and are available in various sizes as a modular system. Thanks to their standard dimensions, they can be easily integrated into existing logistics processes and are therefore primarily used for branch deliveries to bakeries. They do not require any additional Phase Change Materials.



### va-Q-box

The va-Q-box is a vacuum-insulated reusable solution with a powerful ice pack in the lid. It maintains temperatures in the fresh and frozen food range constant up to 48 hours, thereby dispensing with dry ice. The particularly lightweight box can be easily integrated into existing processes and significantly reduces operating costs. In the E-Grocery sector in particular, it enables reliable temperature control across the entire supply chain.



### Individual solutions

va-Q-tec has its own engineering team that designs customized solutions. We work closely with companies to optimize existing systems, for example to extend the self-sufficient temperature holding time (thermal upgrade). In addition, we offer the option of creating boxes with individual dimensions, special materials and in line with the customer's corporate design. We validate and test new developments in our own climate chambers to confirm the functionality and efficiency of the solutions.

## Bakery

Bakeries are increasingly faced with the challenge of transporting fresh baked goods efficiently and safely. Particularly in the area of supply chains, it is crucial that bread, pastries and doughs retain their freshness and quality during transportation. The increasing demands for sustainability, cost optimization and compliance with legal regulations require innovative solutions that make transportation more efficient and resource-conserving.

Traditionally, bakeries often rely on simple packaging and transportation solutions, which in many cases do not provide the necessary temperature control or efficiency. The growing demand for environmentally friendly and cost-efficient refrigerated logistics and the need to reduce food waste make modern technologies essential.

va-Q-tec offers an answer to these challenges with its innovative packaging solutions. By using Vacuum Insulation Panels (VIPs), the company develops passive high-tech transportation solutions that enable temperature control without an external energy supply. These technologies offer efficient transportation and ensure the freshness and quality of baked goods over longer distances and periods of time.

va-Q-tec  
va-Q-tray M 15

va-Q-tec  
va-Q-tray M 15

va-Q-tec  
va-Q-tray M 15

va-Q-tec  
va-Q-tray M 25

va-Q-tec  
va-Q-tray M 15

# Products & Specifications

## Maximum flexibility and efficiency

Thanks to the mix-and-match principle, va-Q-tec solutions offer maximum flexibility: Different boxes (va-Q-trays) and lids (va-Q-lids) can be combined to find the perfect solution for your transportation needs. All the boxes can be randomly stacked among themselves with and without lid. If the box is used without lid, the bottom of the upper box serves as the lid for the lower box. Within a stack, the boxes can fulfill several temperature requirements, e.g. freshness and frozen in one stack. All combinations offer a long temperature holding time without external energy source and are available in standard sizes that can be seamlessly integrated in existing logistics processes.

### va-Q-lid

The va-Q-lids are available in three versions with different sizes, materials and weights. The lids and boxes can be flexibly combined.



### va-Q-tray

The va-Q-trays are available in four versions with different basic dimensions, heights and volumes. All boxes can be flexibly stacked, thereby offering a perfect solution for transportation.

M: External dimension 600 x 400 mm  
(Can also be stacked on size L)

L: Internal dimension 600 x 400 mm  
(Can also be stacked on size M)

# Products & Specifications



Developed for transporting frozen or refrigerated food without refrigerated vehicles, dry ice and ice packs



Self-sufficient temperature holding time from 3 to 6 hours in the frozen and fresh food range without the need of ice packs



Elimination of dry ice and independence from refrigerated vehicles saves running costs



Smooth & easy integration into existing processes thanks to standard logistics dimensions



Modular system: va-Q-trays in four sizes can be combined and stacked as required



Robust reusable solution increases cost efficiency & reduces disposable waste



Suitable for washing lines



Design customization to individual customer requirements possible



Available as a purchase or rental option



Manufactured in a globally CO<sub>2</sub>-neutral company

## va-Q-tray M

### va-Q-lid M

Material: ABS & VIP  
External dimension: 600 x 400 x 22 mm  
Weight: 1.6 kg

### va-Q-lid M light

Material: EPP & VIP  
External dimension: 600 x 400 x 40 mm  
Weight: 0.75 kg



### va-Q-tray M 15

External dimension: 600 x 400 x 120 mm  
Internal dimension: 525 x 325 x 93 mm  
Weight: 2.4 kg  
Performance: 3 - 6 hrs



### va-Q-tray M 25

External dimension: 600 x 400 x 178 mm  
Internal dimension: 525 x 325 x 150 mm  
Weight: 3.3 kg  
Performance: 3 - 6 hrs



### va-Q-tray M 45

External dimension: 600 x 400 x 320 mm  
Internal dimension: 525 x 325 x 265 mm  
Weight: 5.7 kg  
Performance: 3 - 6 hrs



## va-Q-tray L

### va-Q-lid L fresh

Material: ABS with PCM in the lid – must be pre-refrigerated  
External dimension: 655 x 450 x 40 mm  
Weight: 2.9 kg



### va-Q-tray L 35

External dimension: 655 x 450 x 195 mm  
Internal dimension: 603 x 408 x 150 mm  
Compatible with standard baking sheets 60 x 40 cm  
Weight: 3.9 kg  
Performance: 3 - 6 hrs





## Case Study: Hofpfisterei

Hofpfisterei, a traditional bakery company from Munich with over 140 branches, has been using the innovative va-Q-tray boxes for transporting frozen pretzel doughs since January 2022. By using these vacuum-insulated boxes, the bakery can transport its products in a resource-saving and sustainable way while reliably maintaining the cold chain.

We are delighted to have found a partner in va-Q-tec who has responded to our individual needs. [...] The va-Q-trays allow us to save energy and drastically reduce our packaging material. This is good for us and our environment.

Jochem Holterbosch, member of the Hofpfisterei management team and responsible for technology, occupational safety and environmental protection



**Partner since:**  
2022



**Boxes used:**  
4,000 va-Q-tray M 15



**Savings and additional benefits:**

- 100,000 kWh electricity / year
- 50 metric tons packaging waste (primarily cardboard boxes and polyethylene film)
- Sustainable and resource-conserving transportation of frozen doughs by dispensing with active refrigerated vehicles and dry ice
- Jointly developed boxes that are tailored to the needs of the bakery
- Efficiency increase through innovative and flexible logistics solution
- Reliable adherence to the cold chain



## Case Study: Raisch Bakery

The Raisch bakery, a family-run business from Calw with a total of over 30 locations, has been using va-Q-tray boxes to transport various baked goods such as cream cakes, snack items and products from the cold kitchen since 2022. The passive solution from va-Q-tec has made the transportation process more efficient and smoother, especially compared to the EPP boxes previously used.

The logistics processes have changed completely. Because we collect directly into the boxes, we save one work step in production.

Maximilian Raisch, Co-Managing Director of Raisch Bakery



**Partner since:**  
2022



**Boxes used:**  
800 va-Q-tray M 15  
400 va-Q-tray M 25



**Savings and additional benefits:**

- 2.5 hrs collecting time every day
- Boxes fit exactly to the standard dimensions of the bakery baskets
- Low effort for cleaning since no ice packs and lids are required
- Simple cleaning in the basket washing system
- Maintaining the cold chain even at high outside temperatures
- Space saving during transport
- Dispensing with refrigerated vehicles





## Individual Solutions

va-Q-tec offers bakeries the opportunity to customize their va-Q-trays and integrate them perfectly into their corporate design. The boxes can be customized in the company's colors and with its logo, giving them not only a functional but also a brand-strengthening role.

This individualization ensures a professional and uniform brand presence throughout the entire transportation process and strengthens customer recognition. Whether for daily use in stores or for delivery to customers – the customized va-Q-trays not only offer maximum efficiency and quality, but also a strong visual identity for every company.

Personalization of the va-Q-trays with company logo



Color design of the va-Q-trays according to corporate design



## E-Grocery

The E-Grocery sector is growing rapidly, which poses new challenges for companies in the food retail sector, especially when it comes to last-mile delivery. One of the biggest hurdles is maintaining the cold chain to ensure a constant temperature throughout the transportation process. At the same time, companies need to optimize delivery costs and ensure product quality as customer expectations for product variety and freshness increase. In order to remain competitive, cost-efficient and quality-oriented solutions are essential.

va-Q-tec offers a perfect answer to these challenges with its innovative, passive packaging solutions. Our technologies enable a constant temperature without additional energy source. This eliminates the need for dry ice and refrigerated vehicles, which leads to a significant reduction in electricity and operating costs. The cold chain remains intact without any gaps, while the quality of the food is maintained throughout the entire transportation process. This results in fewer complaints and greater customer satisfaction. Overall, these solutions offer a sustainable, cost-efficient and high-quality delivery that optimally meets both, the customer demands and economic requirements.

# Products & Specifications



Developed for transporting frozen or refrigerated food without refrigerated vehicles and dry ice



Self-sufficient temperature holding time of up to 48 hours in the frozen and fresh food range



Elimination of dry ice and independence from refrigerated vehicles saves costs and reduces the CO<sub>2</sub> footprint



Safe technology enables food law-compliant cold chains and minimizes the risk of spoiled goods and customer complaints



Process optimization and reduction of errors thanks to intelligent box design with ice packs integrated in the lid



Comprehensive consultation and support during the implementation process



Development service: Customized solutions or thermal upgrades of existing solutions possible



Available as a purchase or rental option



Manufactured in a globally CO<sub>2</sub>-neutral company

## va-Q-box

### va-Q-box

The va-Q-boxes are particularly lightweight. The ice packs with special PCM integrated in the lid set the required temperature for fresh or frozen products.

#### va-Q-box fresh (-03G)

External dimension	528 x 350 x 353 mm
Internal dimension	447 x 269 x 254 mm
Internal volume	31 l
Weight	5.3 kg
Performance	12 - 36 hrs



#### va-Q-box frozen (-26G)

External dimension	528 x 350 x 353 mm
Internal dimension	447 x 269 x 254 mm
Internal volume	31 l
Weight	5.8 kg
Performance	8 - 24 hrs



Other sizes (e.g. external dimension 600 x 400 mm), temperature requirements or holding times upon request

## va-Q-tray & va-Q-lid

### va-Q-tray with va-Q-lid

These box-lid combinations are ideal for the E-Grocery sector. The boxes are robust, easy to clean and simple to integrate into automated logistics processes. The integrated ice pack in the lid adjusts the temperature in the box to the fresh or frozen temperature range, depending on the application.

#### va-Q-tray M 45 & va-Q-lid M fresh (-03G)

External dimension	600 x 400 x 380 mm
Internal dimension	525 x 325 x 265 mm
Internal volume	47 l
Weight	9.8 kg
Performance	8 - 24 hrs



#### va-Q-tray M 45 & va-Q-lid M frozen (-26G)

External dimension	600 x 400 x 380 mm
Internal dimension	525 x 325 x 265 mm
Internal volume	47 l
Weight	10.4 kg
Performance	6 - 18 hrs



Other sizes, temperature requirements or holding times upon request

# Comparison of different Passive Solutions

## Decision Criterion: Total Cost per year

In order to evaluate the economic efficiency of different passive cooler solutions, the following calculation example compares the costs of the conventional solution with dry ice, the conventional solution with two ice packs and the va-Q-box solutions for the fresh and frozen ranges.

### General conditions

- 5,000 boxes frozen
- 20,000 boxes fresh
- 300 delivery days per year
- Required performance 8 to 12 hours
- Pre-cooling of the ice packs within 24 hours
- Depreciation period 5 years

### Simplification

- All solutions have the same external and internal dimensions
- All solutions have the same weight

### Not taken into account

- Costs such as interest, set-up and conversion costs, training for employees or structural measures when using dry ice
- Increased product quality thanks to high-tech solution
- Reduction in complaints thanks to high-tech solutions (customer reference: 40 % fewer complaints in the frozen and refrigerated range)
- Possible investments for upgrading or building a new cold-storage room

### CAPEX



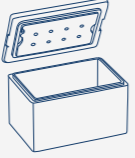


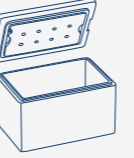
= Capital expenditures per year  
(depending on operating life)  
= Investment in boxes, ice packs, and all the equipment relevant to pre-cooling (such as pre-cooling racks)

### OPEX

= Operational expenditures per year  
= Pre-cooling of ice packs, process costs in the form of required employees, procurement of dry ice

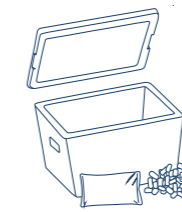
### TOTEX

= Total expenditures per year  
= CAPEX + OPEX

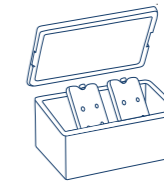
	Frozen			Fresh		
						
	Box with dry ice	Box with two ice packs	va-Q-box frozen	Box with dry ice	Box with two ice packs	va-Q-box fresh
CAPEX in total	75,000 €	200,000 €	700,000 €	300,000 €	800,000 €	3,200,000 €
CAPEX per year (=Annual depreciation)	15,000 €	40,000 €	140,000 €	60,000 €	160,000 €	640,000 €
OPEX per year	2,299,200 €	1,299,901 €	649,951 €	3,186,000 €	2,286,140 €	1,460,070 €
<b>TOTEX per year</b>	<b>2,314,200 €</b>	<b>1,339,901 €</b>	<b>789,950 €</b>	<b>3,246,000 €</b>	<b>2,446,140 €</b>	<b>2,100,070 €</b>

## Other Decision Criteria

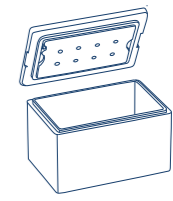
In addition to economic efficiency, other decision criteria also play an important role in choosing the right cooler solution. The following comparison therefore looks at additional factors for the three solutions.



Box with dry ice



Box with two ice packs



va-Q-box

	Box with dry ice	Box with two ice packs	va-Q-box
Complaints	-	+	++
Internal volume	+	+	++
Weight	++	-	+
Sustainability	-	+	++
Flexibility	+	+	++
Social factors & health	-	+	++
Performance	+	+	++
Service life of totes	-	-	++
Simple processes	++	-	+
Process reliability	-	++	++
Low susceptibility to errors	-	+	++
Automation potential	-	+	++

- poor | + good | ++ excellent



## Case Study: Albert Heijn

We are very happy to have gained such an important partner in 2023 with Albert Heijn for our sustainable transport solutions. The boxes were specifically developed for transporting groceries. As a company, we share the vision of an energy-saving and environmentally friendly supply system. In this context, Albert Heijn is a pioneer and role model for sustainable food deliveries.

Marc Moelter, Head of Sales Food at va-Q-tec



Albert Heijn, the leading Dutch supermarket chain, relies on innovative, vacuum-insulated reusable boxes from va-Q-tec for the home delivery of groceries. This solution helps to make the transportation of fresh and frozen products not only more efficient, but also more sustainable and cost-effective.



**Partner since**  
2023



**Boxes used:**  
100,000 va-Q-boxes



**Savings and additional benefits:**

- Sustainable and resource-saving temperature maintenance without the use of refrigerated vehicles and dry ice
- 9,000 metric tons of CO<sub>2</sub>e / year
- Reduction of packaging waste and product losses, especially in summer
- Recyclable reusable solution
- Increased safety during transport
- Significantly reduced complaint rate
- Acceleration of the pick & pack process





# Individual Solutions

## Upgrade of Existing Solutions

va-Q-tec offers the option of upgrading customers' existing transportation solutions with the highly efficient Vacuum Insulation Panels (VIPs) and lids including Phase Change Materials (PCMs).



**Thermal upgrade by retrofitting with PCMs, e.g. in the lid**

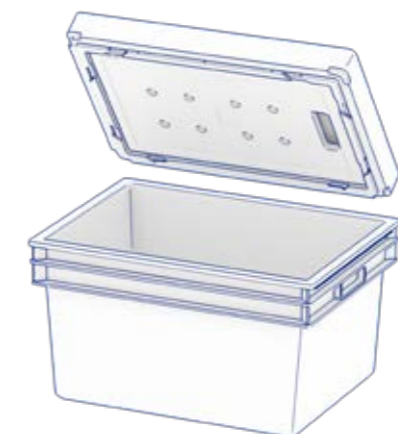
**Subsequent integration of VIPs into existing containers as plug-in or permanently connected concepts**

All adaptations enable reliable temperature control and optimize the transportation process, according to the specific needs of our customers.

## Development of Customized Solutions

In addition to upgrading existing transport boxes, va-Q-tec offers customized solutions for the E-Grocery sector. This involves creating fully customized boxes that are tailored to the customer's requirements and needs in close cooperation with them. The development of these solutions follows a clearly defined and proven process. This ensures that each solution is optimally tailored to the customer's specific requirements.

The detailed process flow is shown on the next page.





# Consultation & Implementation

va-Q-tec works closely with its customers to develop individual and customized solutions for the E-Grocery sector, systematically following a proven process:



## Analysis & Concept Development

va-Q-tec analyzes the current process and develops a tailor-made concept that takes size, temperature requirements and special requests into account. This also includes comprehensive advice on the required pre-cooling. The developed concept is tested with proven in-house simulation software and adapted if necessary.

## Prototypes & Tests

An initial prototype is produced in order to compare it with the current processes and to check its performance, handling and efficiency in initial tests. Based on the test results, the concept is optimized to further improve functionality and efficiency. If required, the concept can be qualified in the in-house laboratory with over 30 climate chambers or by independent partners.

## Production

After concept validation, the production phase begins at va-Q-tec. During this phase, customers receive comprehensive on-site support, including implementation assistance, staff training, video tutorials and information material to ensure smooth integration of the solution into existing operations.

## Post-live Operation

After the initial operating phase, a results analysis is carried out to evaluate the performance of the solution. Furthermore, additional services such as repair and maintenance processes can be implemented to reduce future costs and offer a comprehensive service.



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Get in touch with our experts or schedule an appointment:  
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