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va-Q-tec



Thermo Trolley

Reliable cold chain logistics with minimal operational effort



The cold chain, reimagined

The Thermo Trolley combines high-performance insulation with efficient logistics and a robust design to ensure the cold chain in food retail with minimal effort.

- > No dry ice required
- > Transport without refrigerated vehicles
- > High in-store flexibility

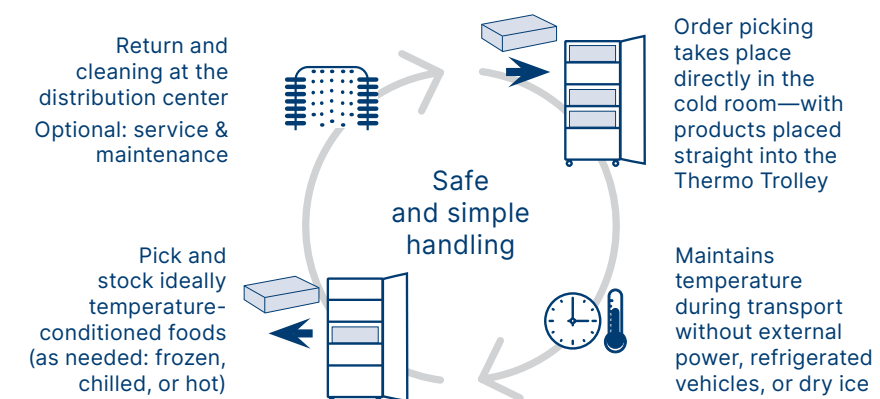
Conventional cold chains are complex and cost-intensive. Refrigerated vehicles with active cooling, dry ice, or bulky cold packs require high energy input, additional process steps for order picking, and substantial infrastructure in distribution centers and stores. At the same time, waiting times and intermediate cooling tie up resources and reduce day-to-day flexibility.

The Thermo Trolley revolutionizes this approach: the combination of high-performance insulation using va-Q-tec vacuum insulation panels (VIPs) and Wanzl's logistics, design, and engineering expertise enables a complete cold chain with minimal handling effort. The internal temperature remains stable—entirely passively (i.e., without external power) and stable for up to 12 hours through thermal loading combined with outstanding insulation performance. Hold time can be extended to up to 24 hours with just two compact cold packs—regardless of whether frozen or chilled goods are transported.

Thermo Trolleys are simply loaded with pre-chilled products and transported on standard trucks without refrigeration units. No energy is required en route, as passive cooling remains constant thanks to vacuum insulation. At the store, there is no need for time-consuming handling of cooling media—especially during peak season in December—or for intermediate cooling. After unloading, the Thermo Trolley can be cleaned at the distribution center if needed and is immediately ready for reuse.

The result: up to 75% lower total operating costs over the product life cycle, increased flexibility, and a significant simplification of logistics processes. The Thermo Trolley enables transport without refrigerated vehicles, dry ice, and in most cases without cold packs—while reliably maintaining the required temperature control.

Trolley-based intralogistics for the cold chain



Using the Thermo Trolley significantly reduces handling effort and enables a simple, sustainable end-to-end process. Preconditioned foods are picked, loaded into the Thermo Trolley, and **transported at stable temperatures for up to 24 hours**—and longer if needed—thanks to innovative vacuum insulation panels. After delivery, the products can be stocked directly in the store. The Thermo Trolley is then returned and cleaned as required. Cleaning via automated wash tunnels is possible.

Expanded applications

The Thermo Trolley does not just create new possibilities in food retail. Other temperature-sensitive industries also benefit from passive high-performance insulation and a robust design.



Intra-company logistics

Safe and simple cooling for internal product flows between production sites, central warehouses, and store networks.



Bakeries & bake shops

Temperature-stable transport of frozen dough pieces and fresh products—without dedicated refrigerated vehicles.



Professional foodservice supply

Reliable temperature control for fresh, chilled, or frozen foods in daily use in kitchens, storage, and delivery.

Thermo Trolley



Dimensions and configuration can be customized



Designed to transport frozen or chilled foods without refrigerated vehicles, dry ice, or cold packs



Standalone temperature hold time up to 12 hours for frozen and chilled goods without cold packs; extend hold time up to 24 hours using two cold packs



Eliminating dry ice and reducing reliance on refrigerated vehicles lowers costs and reduces the carbon footprint



Customization to meet individual customer requirements



Reliable technology enables regulatory-compliant cold chains for food transport (ATP thresholds significantly below limits)



Lower process costs thanks to simple handling, streamlined order picking, and intermediate storage



Robust, ergonomic, and maintenance-free design



Fast cleaning process



Optional: Regular refurbishment / reconditioning programs available





Thermo Trolley Standard Specifications

The Thermo Trolley is engineered to reliably withstand the daily demands of food and fresh logistics. It is available either with casters or with runners, allowing it to be flexibly adapted to different logistics processes. Standard features include ergonomic handles, smooth-action door openers, and a robust inlay to hold products securely and stably in place. The metal surfaces are protected against corrosion thanks to an organic coating.

The version with casters features two fixed and two swivel casters.

The Thermo Trolley is equipped with integrated slide rails at various heights and allows flexible use of optional slide-in shelves as accessories.

Because the Thermo Trolley operates without electrical components, it is essentially maintenance-free. As an option, the insulating performance of the vacuum insulation panels (VIPs) can be checked as part of a service program to help extend service life in a targeted way. At the end of the product life cycle, material-segregated disassembly enables a clean and efficient recycling process, returning each material to its respective recycling stream.



va-Q-trays
For maximum temperature stability in internal transport and order picking.

Thermal Upgrade

By using specially developed, highly insulated, stackable high-tech transportation boxes from va-Q-tec—the va-Q-trays—the thermal performance of the Thermo Trolley can be further optimized. The vacuum-insulated boxes enable precise tailoring to individual logistics processes and can also support multiple temperature zones for chilled and frozen goods within a single Thermo Trolley. This makes the system the ideal solution for especially demanding cold-chain requirements.

Customized solutions

The Thermo Trolley can be precisely tailored to individual customer requirements. Adjustments to the configuration, enhanced temperature tracking, different performance options, and customized branding and service packages enable a solution that integrates seamlessly into existing logistics processes and meets the highest efficiency requirements.

Total Cost and Market Comparison

To assess the cost efficiency of the Thermo Trolley compared to conventional containers, the options below are compared.

- > Up to 75% reduction in total annual costs
- > Positive ROI for the Thermo Trolley after one year
- > Measurable contribution toward achieving climate targets

Conventional containers with dry ice

Dry ice is a proven method for cooling perishable products during transport. The key advantages of this solution are its simplicity and effectiveness. Dry ice sublimates at -78 °C, changing directly from a solid to a gaseous state without leaving residue. This enables continuous cooling without the risk of product damage from moisture.

To transport fresh and frozen products with dry ice, conventional trolleys are typically used in combination with standard insulated boxes, such as polystyrene (EPS) boxes.

Disadvantages & risks of dry ice:

- Dry ice = single-use refrigerant
- Supply shortages, price volatility
- hazardous to health
- fast, but not sustainable cooling
- harmful to the climate
- Product damage to fresh goods is possible

Conventional containers with up to 10 cold packs

Using cold packs is one of the established methods of passive temperature control in food transport. To maintain the cold chain, up to ten preconditioned packs per transport trolley may be used, depending on requirements. They are prepared in cold rooms and transported together with the products in conventional insulated boxes or trolleys. The achievable cooling performance depends on the number of packs, preconditioning, and handling throughout the logistics chain, and it requires additional process steps for storage, order picking, and return logistics.

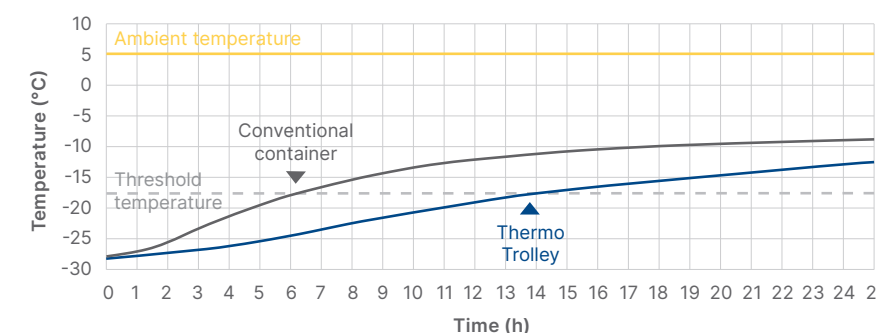
Disadvantages & risks of cold packs:

- High energy demand for pre-cooling and intermediate storage
- Additional handling effort for order picking and return logistics
- Limited cooling performance and dependence on number of packs and loading
- Increased space requirements in storage and transport
- Wear and limited service life of the packs

Thermo Trolley

The high-performance solution is a vacuum-insulated, heavy-duty Thermo Trolley. It represents a significant evolution of the conventional approach and offers improved cooling performance and efficiency.

Thanks to vacuum insulation, food temperatures can be kept stable for up to 12 hours—chilled or frozen—without cold packs. With its robust design, the Thermo Trolley is built for continuous daily operation and remains reliable even under demanding logistics conditions.



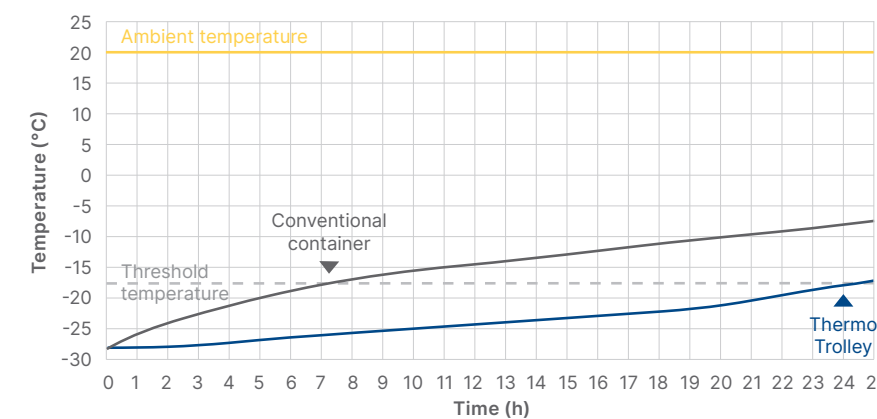
Thermo Trolley without packs vs. conventional container

Test conditions:

- Ambient temperature: constant 5 °C
- Threshold temperature -18 °C
- Load: 150 kg frozen goods

Test results show that, compared with conventional containers, the Thermo Trolley delivers **more than twice the performance**.

With just **two cold packs**, the **temperature hold time** can be **extended up to 24 hours**—for both frozen and chilled goods. For longer transport times, hold time can be increased further by using additional cold packs.



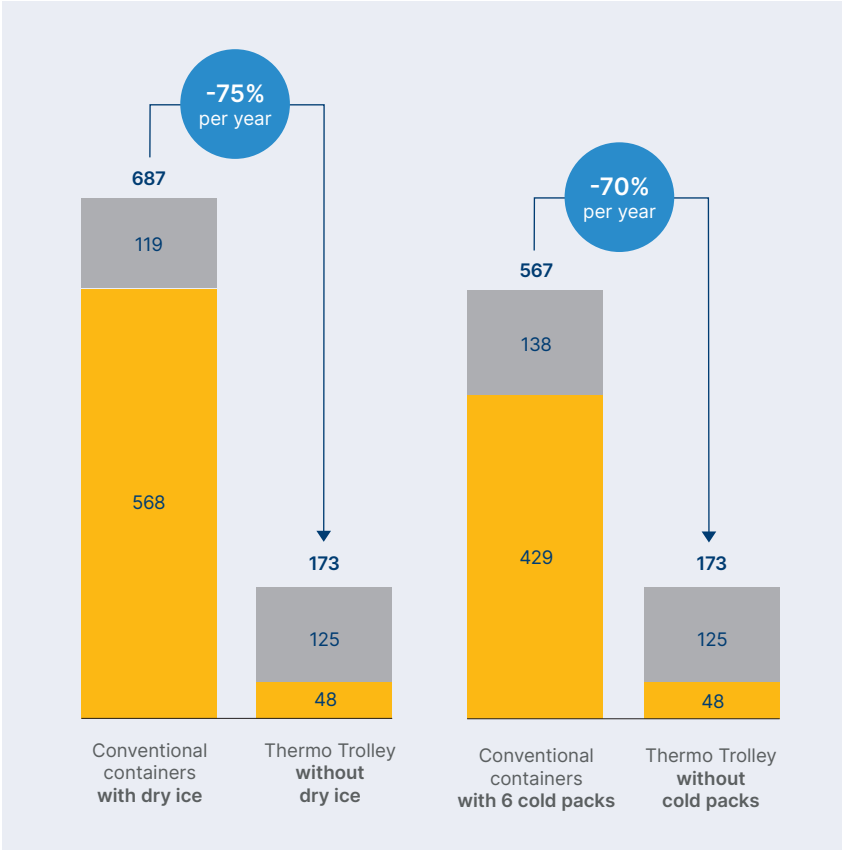
Thermo Trolley with two cold packs vs. conventional container with a corresponding number of comparable packs

Test conditions:

- Ambient temperature constant 20 °C
- Threshold temperature -18 °C
- Load: 150 kg frozen goods

This test also shows that, compared with conventional containers, the Thermo Trolley delivers **more than twice the performance**.

Annual total cost of ownership



Annualized sample calculation for 1,000 trolleys; figures in € thousands

With the Thermo Trolley, **annual total costs can be reduced by up to 75%**—while completely eliminating dry ice and cold packs. **Return on investment** is typically achieved within about **one year**. In addition, the Thermo Trolley offers several strategic benefits: simplified and faster operations, high flexibility, effective support in achieving climate targets, and a durable, repairable system design.

■ CAPEX = annual capital expenditure
■ OPEX = annual operating expense

EXPLANATIONS:
CAPEX = annual capital expenditure (depending on service life)
Investment in trolleys, infrastructure for dry ice, cold packs, and all equipment relevant for preconditioning (cold room/ cold storage room and preconditioning racks)
OPEX = annual operating expense
Preconditioning of cold packs, process costs in the form of required personnel, procurement of dry ice

ASSUMPTIONS:
Conventional containers:
• Use of dry ice or cold packs
• Service life: 8 years
High-performance Thermo Trolley:
• 100% elimination of dry ice and cold packs
• Service life: 12 years

Additional decision criteria in comparison

	Competitor solutions	Thermo Trolley
Ongoing costs (no dry ice / PCM)	-	++
Cooling duration	-	++
Weight	+	+
Cleaning	++	++
Dimensions	++	++
Handling, robustness	+	++
Recyclability	-	++

- less favorable | + good | ++ very good

Technical data

Dimensions and configuration can be tailored to specific requirements and existing logistics processes. The values below refer to the standard dimensions.



	Thermo Trolley with casters	Thermo Trolley with runners
Overall dimensions (W x D x H in mm)	773 × 945 × 1.930	795 × 1.185 × 2.030
Internal dimensions (W x D x H in mm)	610 × 820 × 1.600	620 × 1.055 × 1.740
Internal volume (L)	800	1.130
Empty weight (kg)	169	195
Maximum payload (kg)	500	700
Temperature hold time without cold packs (hrs)	12	12
Temperature hold time with cold packs (hrs)	24*	24*

* longer if required

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About Wanzl

At Wanzl, we combine tradition with innovation. Since the 1970s, when we developed our first logistics products such as the nestable roll container, we have focused on revolutionizing efficiency and functionality in warehouses and production facilities. As the global market leader in shopping carts, we have continuously expanded our know-how and today offer a broad range of intralogistics solutions.

We offer everything you need for smooth transport, order picking, storage, and handling processes.

Today, more than 4,600 people work at Wanzl at 12 production sites worldwide—on new business fields and products, outstanding product design, consistently high quality, and high vertical integration. Our goal: total customer satisfaction.



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www.wanzl.com

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 CO₂ footprint.

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



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