va-Q-tec

ALWAYS THE RIGHT TEMPERATURE

va-Q-proof®

A va-Q-tec TempChain Solution

Always the right temperature

Vacuum Insulation Panels (VIPs) are used wherever space is limited and excellent thermal insulation is required. va-Q-tec has been pioneering the field since 2001 to help resolve difficult spatial design problems, and offers a range of products including cost effective customized VIPs and heat & cold storage elements containing phase change materials (PCMs).

The temperature-controlled logistics field requires everyone to stay up-dated and innovative to comply with the latest regulations and demands. va-Q-tec created the term “TempChain” to replace “cold chain” to encompass all areas and temperature ranges of temperaturecontrolled logistics regardless of the environment and outside temperature.

“With our passive technology and expertise, we provide our clients with cost-efficent, safe and green packaging.”

Dr Joachim Kuhn, Founder & CEO

Why va-Q-tec:

- Reliable and safe
- High-performance in all climates
- Door to door solution (no airport restriction)
- Environmental friendly and lightweight
- A solution for any thermal challenge
- Saves space and energy
- No external energy supply needed
- Passive solution prevent technical problem
- 100% VIP and PCM controlled thermal packaging
- Award winning technology
- More than 30 worldwide active patents

va-Q-accus define the temperature
Phase Change Material (PCM) accumulates and releases thermal energy during melting and freezing, to perfectly maintain the required product storage temperature for the duration of transportation.

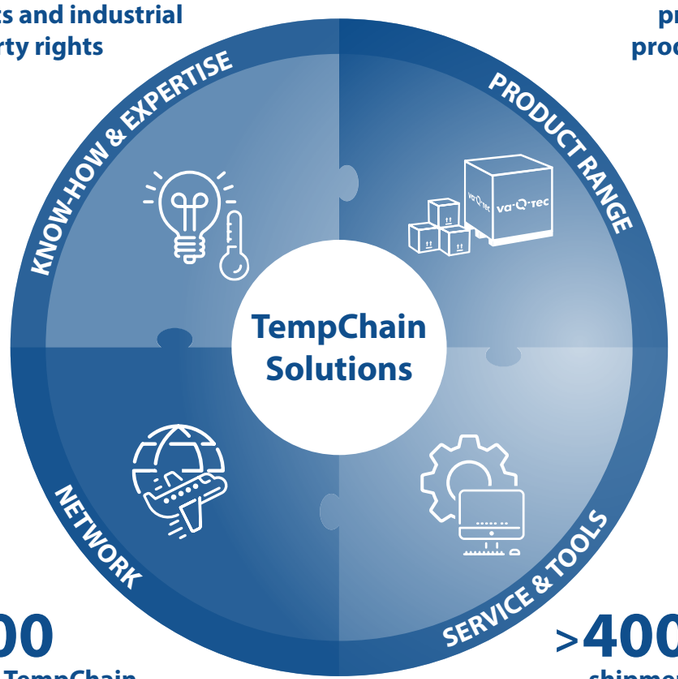
VIPs maintain the defined temperature
VIPs – Vacuum Insulation Panels – are flat panels for optimized temperature insulation that are based on the principle of the thermos flask. These panels offer unparalleled heat and cold insulation at minimum thickness.

Qualified High Performance Packaging
As a core component manufacturer, we design and produce products with state of the art solutions and many economic and ecological advantages, such as recycling possibilities and superior quality with an excellent price/performance ratio. Our products are designed with one pack-out configuration for all seasons that simplifies handling and reduces risk. They are validated to strict standards to ensure safe transportation cycles of many days.

Business Unit Healthcare & Logistics

>180
patents and industrial property rights

>1.000
products and product set ups



>500
global TempChain Service Centers and Drop Points

>400.000
shipments per year run via the TempChain Service Software

va-Q-tec pioneered TempChain **Know-how & Expertise** already since 2003 by creating the first passive PCM/VIP thermal packaging Solutions. Therefore the company is able to provide extensive engineering consulting and professional laboratory service.

All temperatures and all volumes can be served from va-Q-tec's comprehensive **Product range**. Even the most challenging destinations.

More than 1.5 Mio. boxes and containers have been pre-conditioned in va-Q-tec's qualified TempChain **Service**. This process is enabled by unique **Tools** such as the patented quality control system va-Q-check®.

In va-Q-tec's TempChain **Network,** 2.000 containers and several 10.000 boxes can secure global availability and quick delivery from 35 TempChain Service Centers worldwide.

TempChain Service

We are the expert in the field of efficient temperature-controlled logistics and have built up a high-performance product portfolio available in the extensive global TempChain Network.
Processing orders based on our TempChain Services saves time and allows you to focus on your core business:

- With our TempChain Service Software we provide an advanced software solution to track and control all data around your order. We provide all logistical steps clearly and efficiently combined in one tool: Size and temperature selection of containers and boxes, shipment scheduling, status monitoring of the shipment and temperature reporting.
- The innovative va-Q-nection solution is available as an additional feature. The va-Q-proof becomes smart with a unique Bluetooth Low Energy data logger. The temperature report can be read out easily by the va-Q-nection App without opening the box and interrupting the TempChain. This ensures the completion in your TempChain documentation.
- Our “Operational Support Service” forms the basis for an exceptional supply chain that runs smoothly from production to the patient. A key component of this is the “Technology Transfer Package” (TTP), which includes defined processes and practical employee training.
It facilitates your qualification and enables you a smooth transition to our technology.

“We provide unlimited support and are able to solve any thermal challenge!”

Fabian Eschenbach, Head of Business Unit Healthcare & Logistics

TempChain Service Software

TempChain Service Software:
The big step to data visibility & connectivity

With our innovative online order portal, we offer a unique innovative service for the rental of our “ready to load & go” boxes and containers or purchase our preconditioned boxes. The portal is intuitive to use and offers the fast handling of all order processes. Additionally, our TempChain Services can be monitored and controlled in detail centrally and location-independently by the software.

The TempChain Service Software advantages:

- The central control of the complete supply chain process makes the entire TempChain more secure and transparent. Errors in the process can be avoided and deviations are minimized
- You save time and thus costs due to the completely centralized order processing with the help of the software
- Countless interfaces between the software and operational processes as well as the va-Q-check measuring system and quality tests ensure the 100% quality of our products and services
- All data of the order are stored absolutely forgery-proof by BlockChain technology

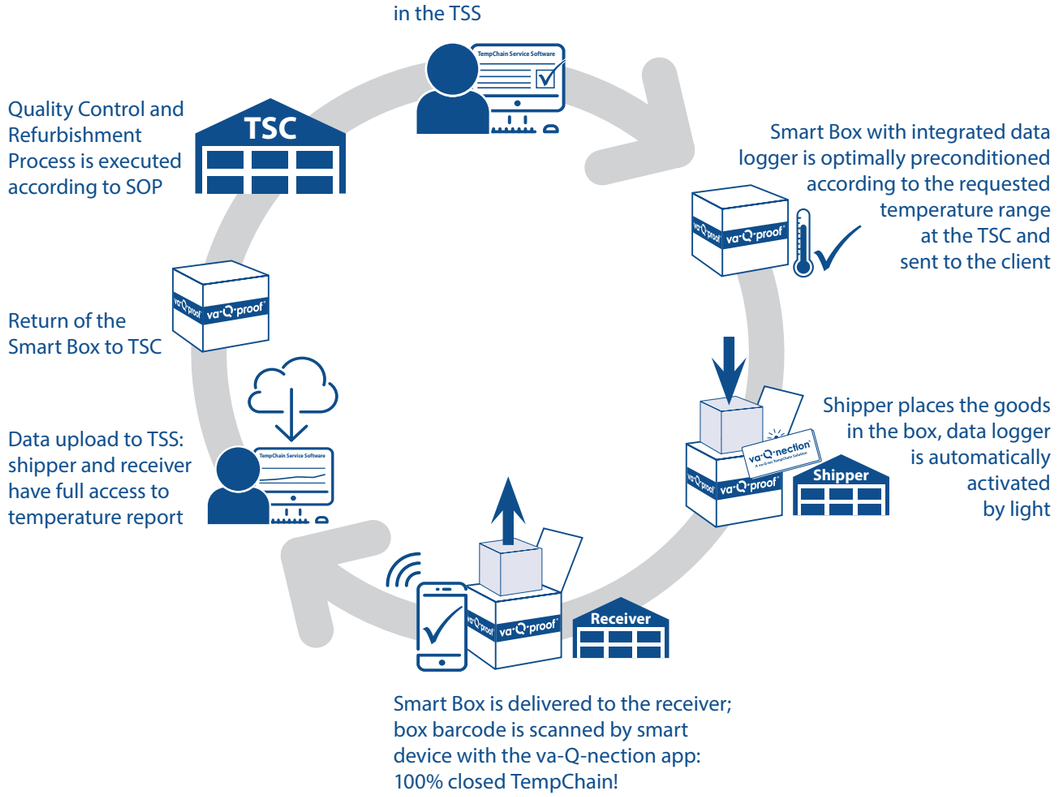
va-Q-nection

Our fully comprehensive service solution va-Q-nection supports you in the uncomplicated, safe monitoring of the TempChain during the entire transport to proof full GDP-compliance. The Innovation enables traceability in an easy to use and secure way, combining the advantages of our unique TempChain technology components:

- The permanently installed multi-use data logger within our Smart Boxes supported Bluetooth Low Energy technology
- An app which enables the receiver to read out the temperature report by a smart device without interrupting the TempChain by opening the packaging solution
- The TempChain Service Software, which gives you location-independently access to the temperature data of your shipment

Technical details:

Criteria	Description
Measured Parameters	Temperature (°C) & light changing events (for detecting box open / close events)
Operating Range	+2 °C to +8 °C and +15 °C to +25 °C
Measurement Accuracy	± 0.5 °C
Measurement Interval	5 minutes
Data Read Out	Via smartphone app or gateway (Bluetooth Low Energy)
Temperature Report	Automatically generated after the receiver scans box-ID or box returns to va-Q-tec (“read-out-guarantee”)
Airline Approval	IATA compliant, approved by DHL, Fedex and UPS



The most comprehensive thermal packaging portfolio

Payload <<< parcel size

Volume pallet size >>>

Difficulty to return the packaging into the TempChain Network

low <<<

<<< high

va-Q-med®
(for domestic distribution)

Temperature range
from -25 °C to +25 °C

5 Liter — 18 Liter

va-Q-proof®

Temperature range
from -40 °C to +25 °C

4 Liter — 264 Liter

va-Q-tainer®/va-Q-case®

Temperature range
from -60 °C to +25 °C

1/2 EURO pallet — 2 US pallets

va-Q-one®

Temperature range
from -25 °C to +25 °C

4 Liter — 74 Liter

va-Q-pal®

Temperature range
from -25 °C to +25 °C

1 US pallet

va-Q-proof®

- **Designed for multi-use:**
  Re-qualification w/ va-Q-check® secures day-one-validation
- **Two qualified performance levels (without payload inside):**
  from >96h to >168h according ISTA 7D
- **Comprehensive size portfolio: from 4 to 264 L payload volume**
- **Unique qualified temperature ranges: from -40 °C (without dry ice) to +25 °C**
- **Easy handling: All-season packout and "ready to load & go" delivery**
- **Modular system: Customization possible, single-components available, core components are replaceable and recyclable**
- **Core Components & Technology "MADE IN GERMANY"**
- **With the rental option the entire TempChain logistic process is manageable with the comprehensive TempChain Service Software**
- **Optional available with our rental Services: va-Q-nection Service offers seamless and quick temperature reporting via cloud-based technology**

va-Q-accu +22G	va-Q-accu +05G	va-Q-accu -21G	va-Q-accu -32G
for +15 °C to +25 °C	for +2 °C to +8 °C	for -25 °C to -15 °C	for -40 °C to -20 °C

Other temperature ranges available on request (e.g. body temperature, deep frozen, etc.), below -60 °C with dry ice.

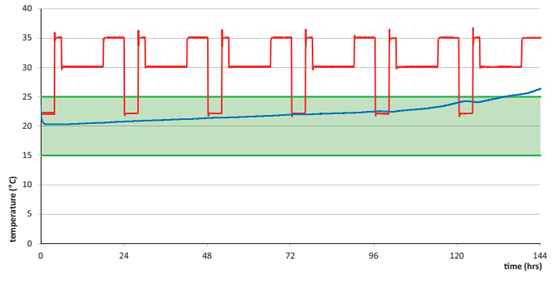
va-Q-proof® 4 Standard data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	325 x 315 x 310	12.8 x 12.4 x 12.2	160 x 160 x 160	6.3 x 6.3 x 6.3	4	9.3	20.5	≥ 119	≥ 1238
va-Q-accu +05G[2]	325 x 315 x 310	12.8 x 12.4 x 12.2	160 x 160 x 160	6.3 x 6.3 x 6.3	4	9.3	20.5	≥ 123	≥ 3124
va-Q-accu -21G[2]	325 x 315 x 310	12.8 x 12.4 x 12.2	160 x 160 x 160	6.3 x 6.3 x 6.3	4	11.6	25.6	≥ 120	≥ 5436

Real test examples

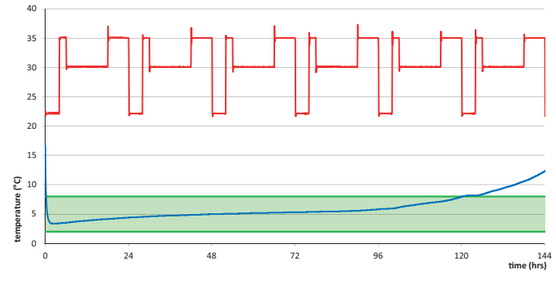
With **va-Q-accu +22G²**

- Time between +15.0 °C and +25.0 °C: **133 hours**
- Temp x time: **1383 KelvinHours**



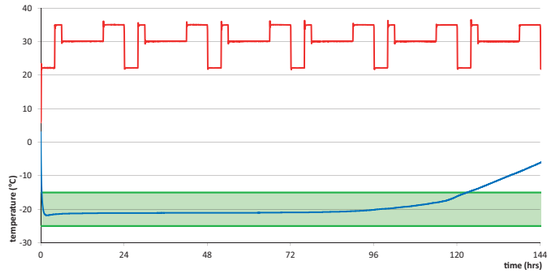
With **va-Q-accu +05G²**

- Time between +2.0 °C and +8.0 °C: **127 hours**
- Temp x time: **3226 KelvinHours**



With **va-Q-accu -21G²**

- Time between -25.0 °C and -15.0 °C: **124 hours**
- Temp x time: **6250 KelvinHours**



ambient — center of good — requested range

[1] The easy way to reliably compare thermal packaging solutions:
More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

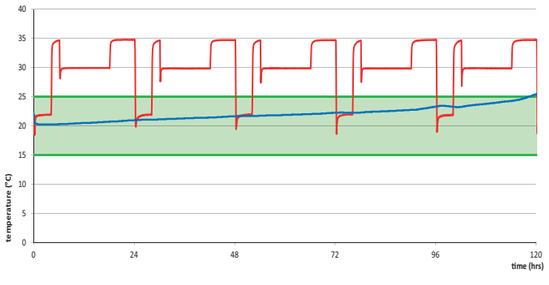
va-Q-proof® 11 Standard data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	365 x 360 x 355	14.4 x 14.2 x 14.0	220 x 220 x 220	8.6 x 8.6 x 8.6	11	10.1	22.3	≥ 113	≥ 1096
va-Q-accu +05G[2]	365 x 360 x 355	14.4 x 14.2 x 14.0	220 x 220 x 220	8.6 x 8.6 x 8.6	11	10.0	22.0	≥ 82	≥ 2042
va-Q-accu -21G[2]	365 x 360 x 355	14.4 x 14.2 x 14.0	220 x 220 x 220	8.6 x 8.6 x 8.6	11	12.1	26.7	≥ 79	≥ 3918
va-Q-accu -32G[2]	365 x 360 x 355	14.4 x 14.2 x 14.0	220 x 220 x 220	8.6 x 8.6 x 8.6	11	12.8	28.2	≥ 59	≥ 3505

Real test examples

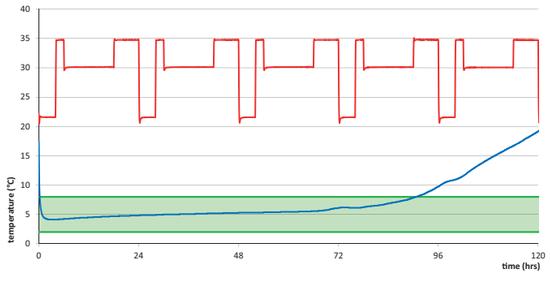
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **119 hours**
- Temp x time: **1178 KelvinHours**



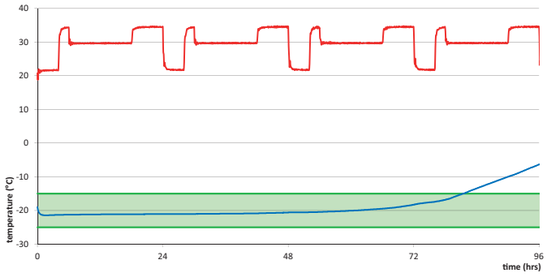
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **91 hours**
- Temp x time: **2275 KelvinHours**



With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **82 hours**
- Temp x time: **4067 KelvinHours**



ambient — center of good — requested range

[1] The easy way to reliably compare thermal packaging solutions: More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

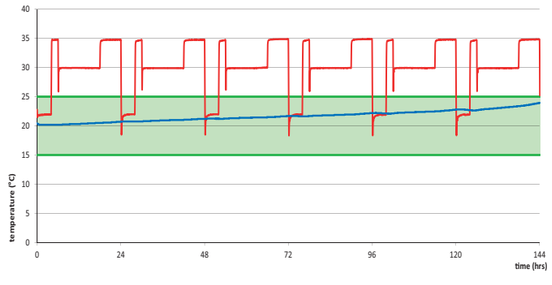
va-Q-proof® 11 Premium data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	365 x 360 x 355	14.4 x 14.2 x 14.0	200 x 200 x 200	7.9 x 7.9 x 7.9	8	12.4	27.3	≥ 144	≥ 1426
va-Q-accu +05G[2]	365 x 360 x 355	14.4 x 14.2 x 14.0	200 x 200 x 200	7.9 x 7.9 x 7.9	8	12.3	27.1	≥ 139	≥ 3447
va-Q-accu -21G[2]	365 x 360 x 355	14.4 x 14.2 x 14.0	200 x 200 x 200	7.9 x 7.9 x 7.9	8	15.4	34.0	≥ 119	≥ 5974
va-Q-accu -32G[2]	365 x 360 x 355	14.4 x 14.2 x 14.0	200 x 200 x 200	7.9 x 7.9 x 7.9	8	16.3	35.9	≥ 96	≥ 5422

Real test examples

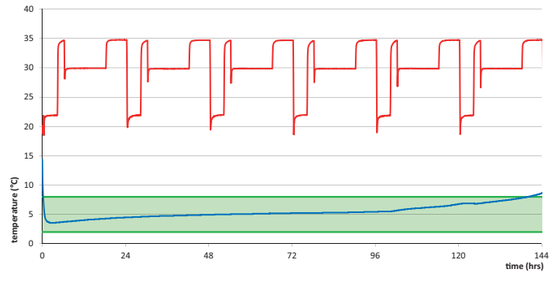
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **> 144 hours**
- Temp x time: **> 1440 KelvinHours**



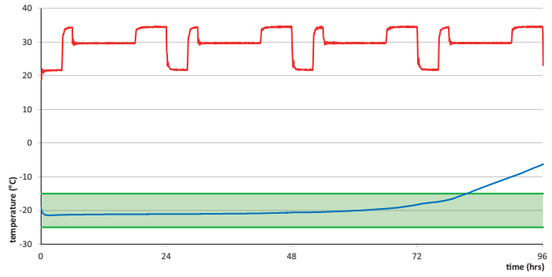
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **141 hours**
- Temp x time: **3536 KelvinHours**



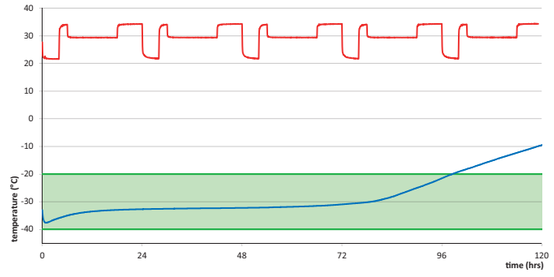
With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **128 hours**
- Temp x time: **6413 KelvinHours**



With va-Q-accu -32G[2]

- Time between -40.0 °C and -20.0 °C: **97 hours**
- Temp x time: **5801 KelvinHours**



ambient — center of good — requested range

[1] The easy way to reliably compare thermal packaging solutions: More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

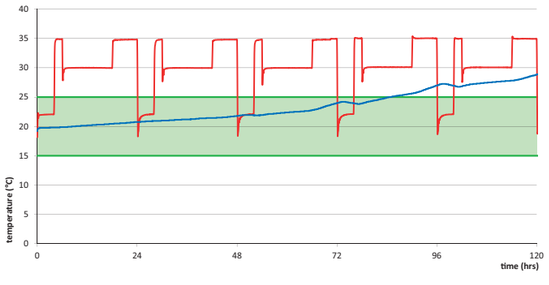
va-Q-proof® 16 Standard data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	460 x 355 x 355	18.1 x 14.0 x 14.0	320 x 220 x 220	12.6 x 8.7 x 8.7	16	12.7	28.0	≥ 73	≥ 730
va-Q-accu +05G[2]	460 x 355 x 355	18.1 x 14.0 x 14.0	320 x 220 x 220	12.6 x 8.7 x 8.7	16	12.6	27.8	≥ 74	≥ 1850
va-Q-accu -21G[2]	460 x 355 x 355	18.1 x 14.0 x 14.0	320 x 220 x 220	12.6 x 8.7 x 8.7	16	15.3	33.7	≥ 93	≥ 4622
va-Q-accu -32G[2]	460 x 355 x 355	18.1 x 14.0 x 14.0	320 x 220 x 220	12.6 x 8.7 x 8.7	16	16.2	35.7	≥ 71	≥ 4267

Real test examples

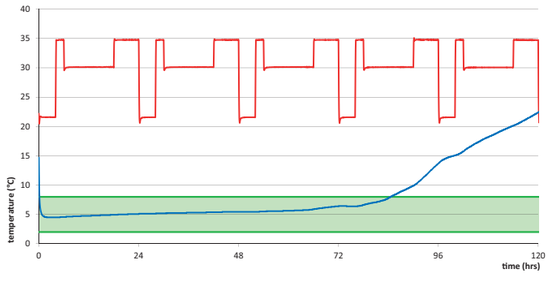
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **87 hours**
- Temp x time: **853 KelvinHours**



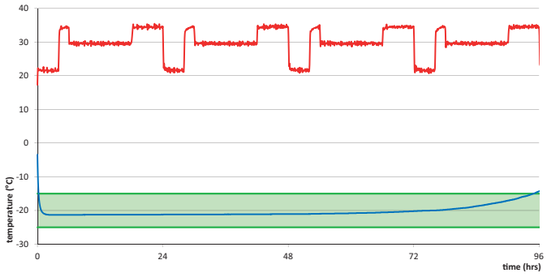
With va-Q-accu +05G[2]

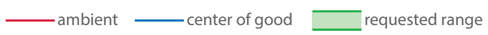
- Time between +2.0 °C and +8.0 °C: **84 hours**
- Temp x time: **2092 KelvinHours**



With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **95 hours**
- Temp x time: **4731 KelvinHours**





[1] The easy way to reliably compare thermal packaging solutions: More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

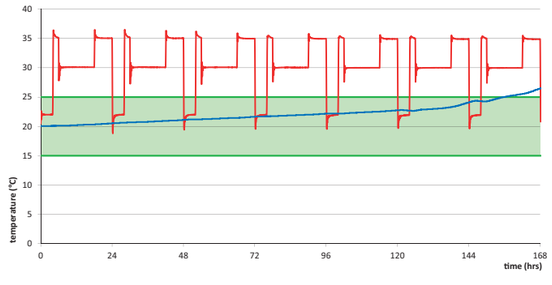
va-Q-proof® 16 Premium data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	460 x 355 x 355	18.1 x 14.0 x 14.0	300 x 200 x 200	11.8 x 7.9 x 7.9	12	15.7	34.6	≥ 151	≥ 1525
va-Q-accu +05G[2]	460 x 355 x 355	18.1 x 14.0 x 14.0	300 x 200 x 200	11.8 x 7.9 x 7.9	12	15.6	34.4	≥ 131	≥ 3288
va-Q-accu -21G[2]	460 x 355 x 355	18.1 x 14.0 x 14.0	300 x 200 x 200	11.8 x 7.9 x 7.9	12	19.5	43.0	≥ 86	≥ 4300
va-Q-accu -32G[2]	460 x 355 x 355	18.1 x 14.0 x 14.0	300 x 200 x 200	11.8 x 7.9 x 7.9	12	21.0	46.3	≥ 92	≥ 5529

Real test examples

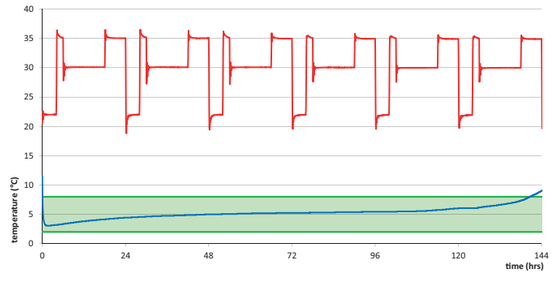
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **156 hours**
- Temp x time: **1576 KelvinHours**



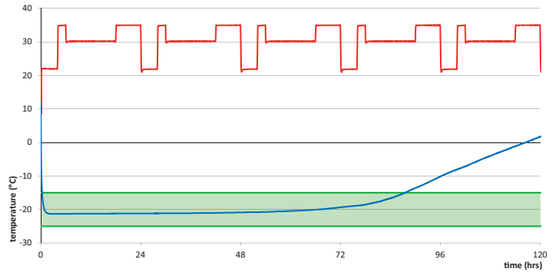
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **143 hours**
- Temp x time: **3604 KelvinHours**



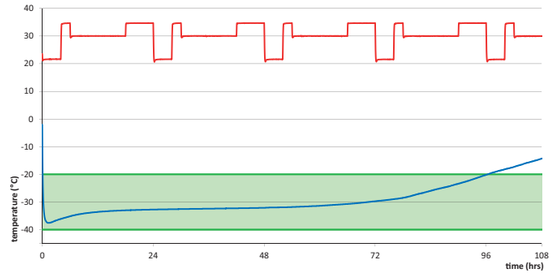
With va-Q-accu -21G[2]

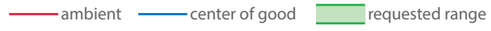
- Time between -25.0 °C and -15.0 °C: **87 hours**
- Temp x time: **4350 KelvinHours**



With va-Q-accu -32G[2]

- Time between -40.0 °C and -20.0 °C: **96 hours**
- Temp x time: **5770 KelvinHours**





[1] The easy way to reliably compare thermal packaging solutions: More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

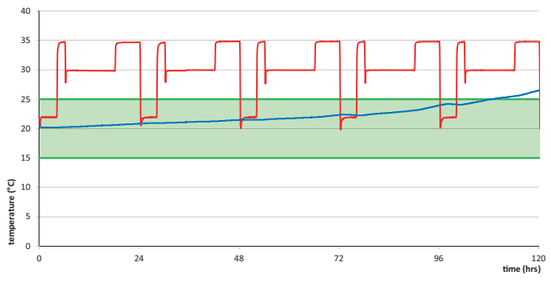
va-Q-proof® 23 Standard data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	470 x 455 x 355	18.5 x 17.9 x 14.0	320 x 320 x 220	12.6 x 12.6 x 8.7	23	15.4	34.0	≥ 105	≥ 1040
va-Q-accu +05G[2]	470 x 455 x 355	18.5 x 17.9 x 14.0	320 x 320 x 220	12.6 x 12.6 x 8.7	23	15.3	33.7	≥ 110	≥ 2750
va-Q-accu -21G[2]	470 x 455 x 355	18.5 x 17.9 x 14.0	320 x 320 x 220	12.6 x 12.6 x 8.7	23	18.7	41.2	≥ 89	≥ 4414
va-Q-accu -32G[2]	470 x 455 x 355	18.5 x 17.9 x 14.0	320 x 320 x 220	12.6 x 12.6 x 8.7	23	19.8	43.7	≥ 79	≥ 4708

Real test examples

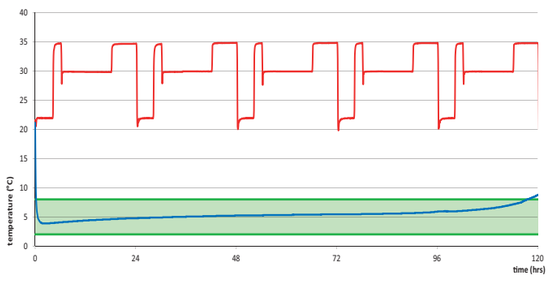
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **109 hours**
- Temp x time: **1079 KelvinHours**



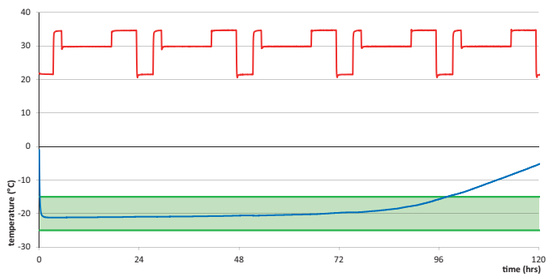
With va-Q-accu +05G[2]

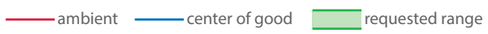
- Time between +2.0 °C and +8.0 °C: **117 hours**
- Temp x time: **2925 KelvinHours**



With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **98 hours**
- Temp x time: **4880 KelvinHours**





[1] The easy way to reliably compare thermal packaging solutions:
More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

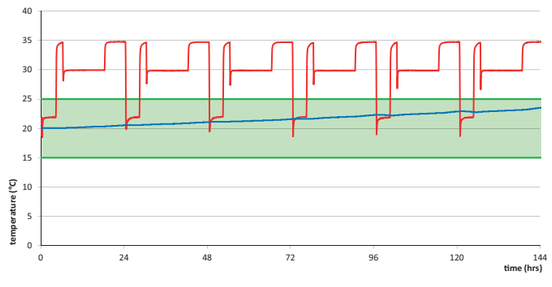
va-Q-proof® 23 Premium data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	470 x 455 x 355	18.5 x 17.9 x 14.0	300 x 300 x 200	11.8 x 11.8 x 7.9	18	19.2	42.3	≥ 144	≥ 1440
va-Q-accu +05G[2]	470 x 455 x 355	18.5 x 17.9 x 14.0	300 x 300 x 200	11.8 x 11.8 x 7.9	18	19.0	41.9	≥ 144	≥ 3600
va-Q-accu -21G[2]	470 x 455 x 355	18.5 x 17.9 x 14.0	300 x 300 x 200	11.8 x 11.8 x 7.9	18	24.3	53.6	≥ 110	≥ 5500
va-Q-accu -32G[2]	470 x 455 x 355	18.5 x 17.9 x 14.0	300 x 300 x 200	11.8 x 11.8 x 7.9	18	25.8	56.9	≥ 107	≥ 6388

Real test examples

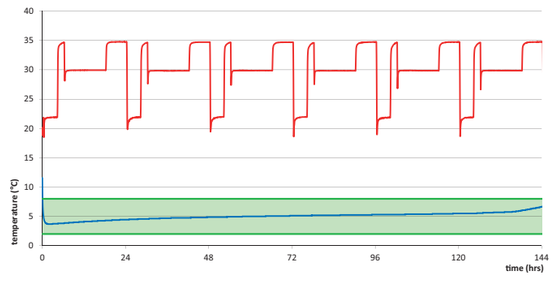
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **> 144 hours**
- Temp x time: **> 1440 KelvinHours**



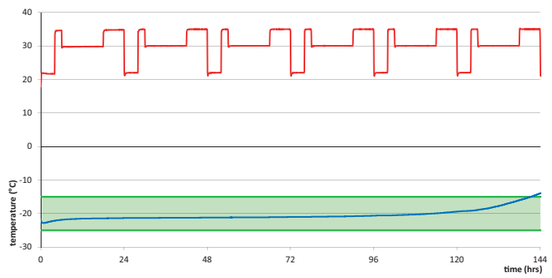
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **> 144 hours**
- Temp x time: **> 3600 KelvinHours**



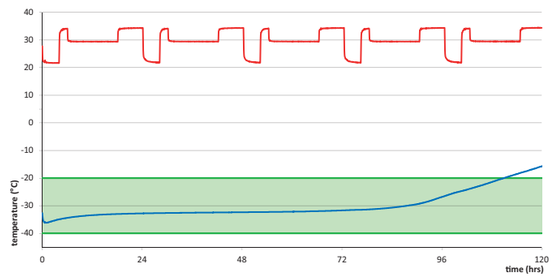
With va-Q-accu -21G[2]

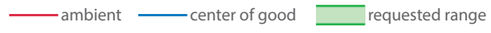
- Time between -25.0 °C and -15.0 °C: **141 hours**
- Temp x time: **7078 KelvinHours**



With va-Q-accu -32G[2]

- Time between -40.0 °C and -20.0 °C: **109 hours**
- Temp x time: **6496 KelvinHours**





[1] The easy way to reliably compare thermal packaging solutions:
More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

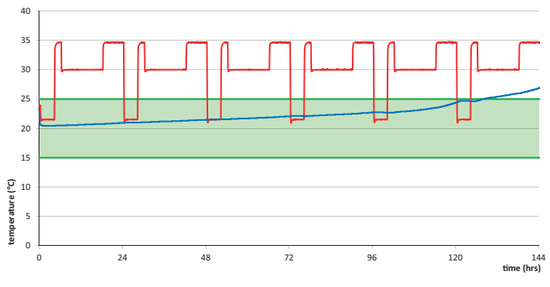
va-Q-proof® 30 Standard data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	560 x 450 x 355	22.1 x 17.7 x 14.0	420 x 320 x 220	16.5 x 12.6 x 8.7	30	18.7	41.2	≥ 115	≥ 1139
va-Q-accu +05G[2]	560 x 450 x 355	22.1 x 17.7 x 14.0	420 x 320 x 220	16.5 x 12.6 x 8.7	30	18.5	40.8	≥ 111	≥ 2753
va-Q-accu -21G[2]	560 x 450 x 355	22.1 x 17.7 x 14.0	420 x 320 x 220	16.5 x 12.6 x 8.7	30	22.9	53.4	≥ 97	≥ 4831

Real test examples

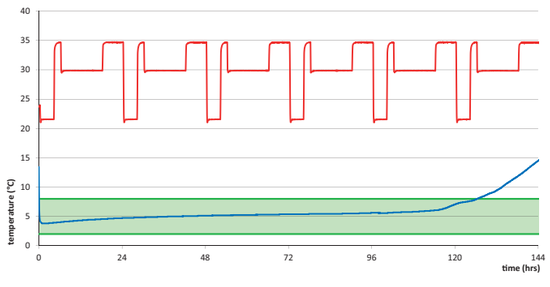
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **127 hours**
- Temp x time: **1257 KelvinHours**



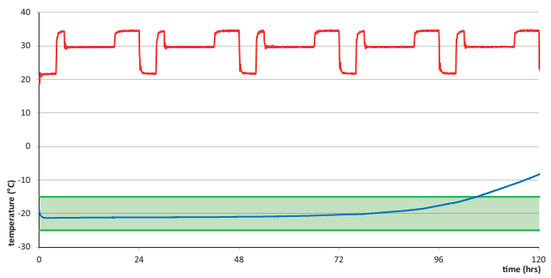
With va-Q-accu +05G[2]

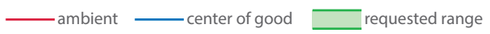
- Time between +2.0 °C and +8.0 °C: **126 hours**
- Temp x time: **3125 KelvinHours**



With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **104 hours**
- Temp x time: **5169 KelvinHours**





[1] The easy way to reliably compare thermal packaging solutions: More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

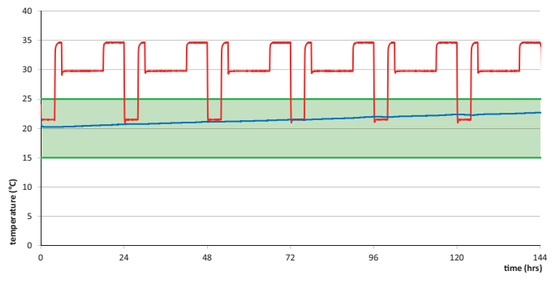
va-Q-proof® 30 Premium data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	560 x 450 x 355	22.1 x 17.7 x 14.0	400 x 300 x 200	15.7 x 11.8 x 7.9	24	23.0	50.7	> 144	> 1440
va-Q-accu +05G[2]	560 x 450 x 355	22.1 x 17.7 x 14.0	400 x 300 x 200	15.7 x 11.8 x 7.9	24	22.8	50.3	> 144	> 3629
va-Q-accu -21G[2]	560 x 450 x 355	22.1 x 17.7 x 14.0	400 x 300 x 200	15.7 x 11.8 x 7.9	24	29.2	64.4	≥ 123	≥ 6125

Real test examples

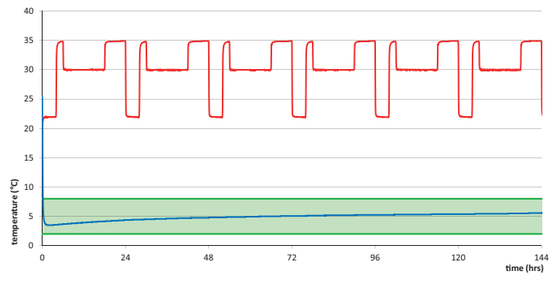
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **>144 hours**
- Temp x time: **> 1440 KelvinHours**



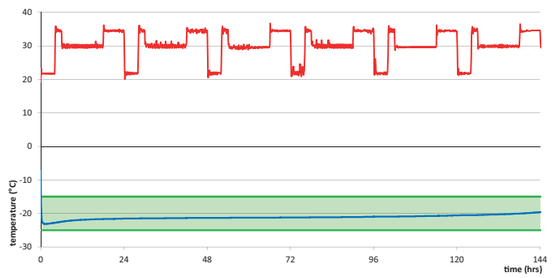
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **> 144 hours**
- Temp x time: **> 3629 KelvinHours**



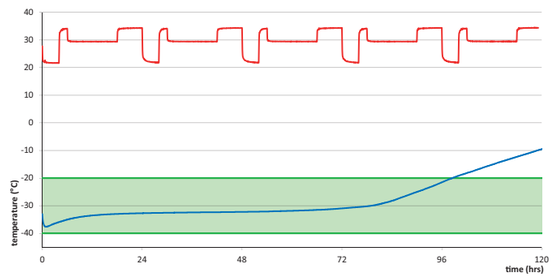
With va-Q-accu -21G[2]

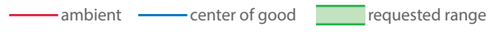
- Time between -25.0 °C and -15.0 °C: **> 144 hours**
- Temp x time: **> 7200 KelvinHours**



With va-Q-accu -32G[2]

- Time between -40.0 °C and -20.0 °C: **104 hours**
- Temp x time: **6230 KelvinHours**





[1] The easy way to reliably compare thermal packaging solutions: More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

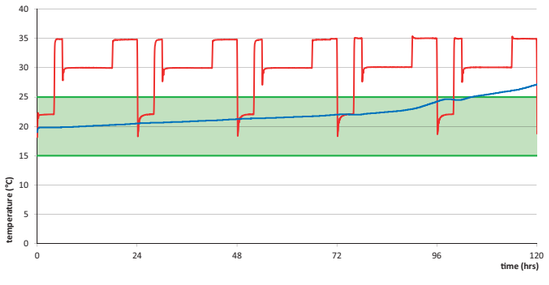
va-Q-proof® 33 Standard data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	460 x 455 x 455	18.1 x 17.9 x 17.9	320 x 320 x 320	12.6 x 12.6 x 12.6	33	18.6	41.0	≥ 92	≥ 920
va-Q-accu +05G[2]	460 x 455 x 455	18.1 x 17.9 x 17.9	320 x 320 x 320	12.6 x 12.6 x 12.6	33	18.5	40.8	≥ 95	≥ 2385
va-Q-accu -21G[2]	460 x 455 x 455	18.1 x 17.9 x 17.9	320 x 320 x 320	12.6 x 12.6 x 12.6	33	22.5	49.6	≥ 90	≥ 4464
va-Q-accu -32G[2]	460 x 455 x 455	18.1 x 17.9 x 17.9	320 x 320 x 320	12.6 x 12.6 x 12.6	33	23.7	52.2	≥ 58	≥ 3463

Real test examples

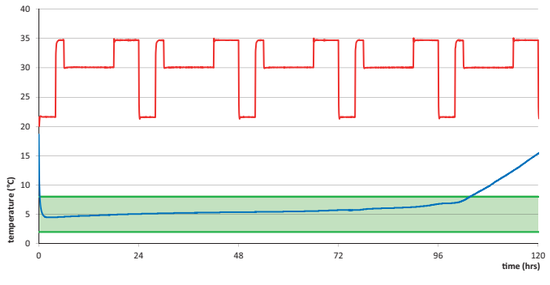
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **105 hours**
- Temp x time: **1040 KelvinHours**



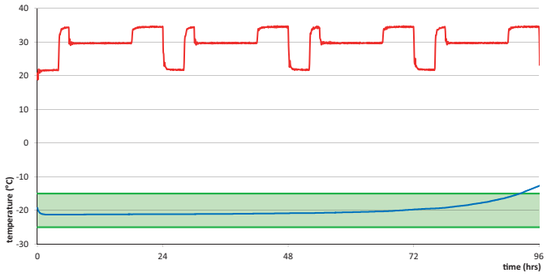
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **104 hours**
- Temp x time: **2590 KelvinHours**



With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **92 hours**
- Temp x time: **4572 KelvinHours**



ambient — center of good — requested range

[1] The easy way to reliably compare thermal packaging solutions: More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

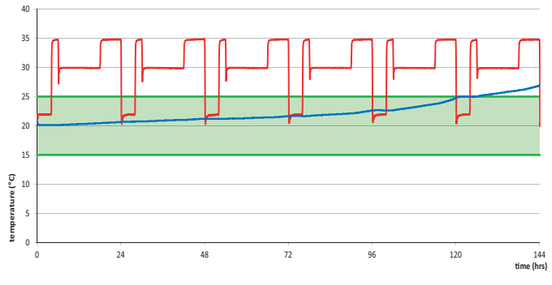
va-Q-proof® 33 Premium data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	460 x 455 x 455	18.1 x 17.9 x 17.9	300 x 300 x 300	11.8 x 11.8 x 11.8	27	23.0	50.7	> 106	> 1049
va-Q-accu +05G[2]	460 x 455 x 455	18.1 x 17.9 x 17.9	300 x 300 x 300	11.8 x 11.8 x 11.8	27	22.8	50.3	≥ 107	≥ 1059
va-Q-accu -21G[2]	460 x 455 x 455	18.1 x 17.9 x 17.9	300 x 300 x 300	11.8 x 11.8 x 11.8	27	29.0	63.9	≥ 140	≥ 3528
va-Q-accu -32G[2]	460 x 455 x 455	18.1 x 17.9 x 17.9	300 x 300 x 300	11.8 x 11.8 x 11.8	27	30.8	67.9	> 110	> 6534

Real test examples

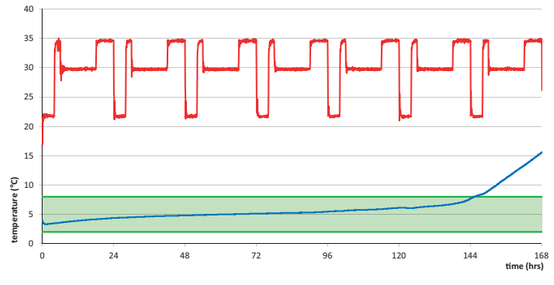
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **121 hours**
- Temp x time: **1222 KelvinHours**



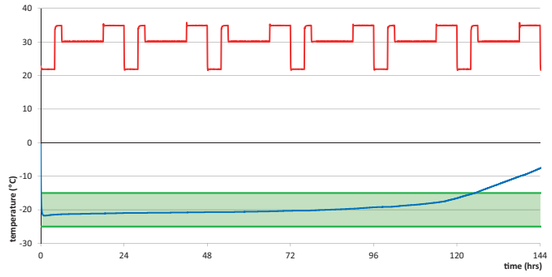
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **145 hours**
- Temp x time: **3611 KelvinHours**



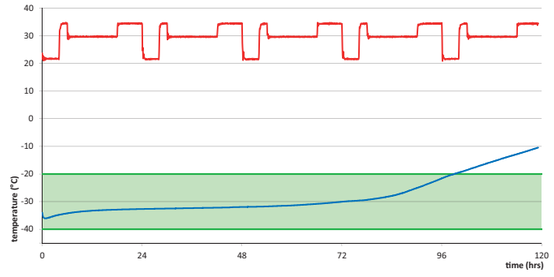
With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **126 hours**
- Temp x time: **6313 KelvinHours**



With va-Q-accu -32G[2]

- Time between -40.0 °C and -20.0 °C: **98 hours**
- Temp x time: **5851 KelvinHours**



ambient — center of good — requested range

[1] The easy way to reliably compare thermal packaging solutions: More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

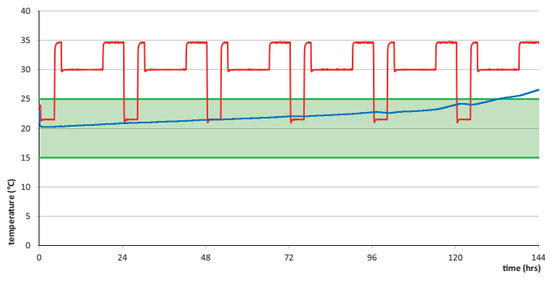
va-Q-proof® 43 Standard data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	570 x 455 x 455	22.4 x 17.9 x 17.9	420 x 320 x 320	16.5 x 12.6 x 12.6	43	22.6	49.8	≥ 117	≥ 1158
va-Q-accu +05G[2]	570 x 455 x 455	22.4 x 17.9 x 17.9	420 x 320 x 320	16.5 x 12.6 x 12.6	43	22.4	49.4	≥ 120	≥ 3000
va-Q-accu -21G[2]	570 x 455 x 455	22.4 x 17.9 x 17.9	420 x 320 x 320	16.5 x 12.6 x 12.6	43	27.7	61.1	101	5030
va-Q-accu -32G[2]	570 x 455 x 455	22.4 x 17.9 x 17.9	420 x 320 x 320	16.5 x 12.6 x 12.6	43	29.3	64.6	≥ 86	≥ 5126

Real test examples

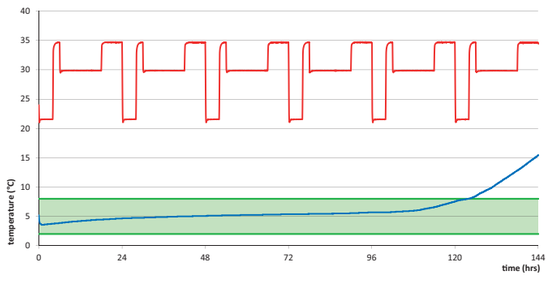
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **133 hours**
- Temp x time: **1197 KelvinHours**



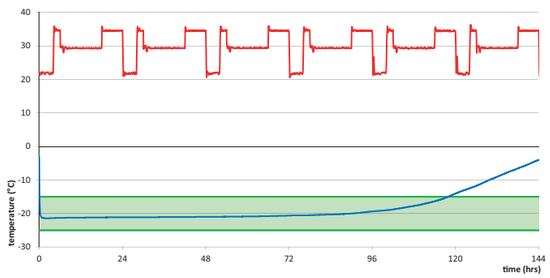
With va-Q-accu +05G[2]

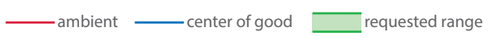
- Time between +2.0 °C and +8.0 °C: **118 hours**
- Temp x time: **2950 KelvinHours**



With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **118 hours**
- Temp x time: **5865 KelvinHours**





[1] The easy way to reliably compare thermal packaging solutions: More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

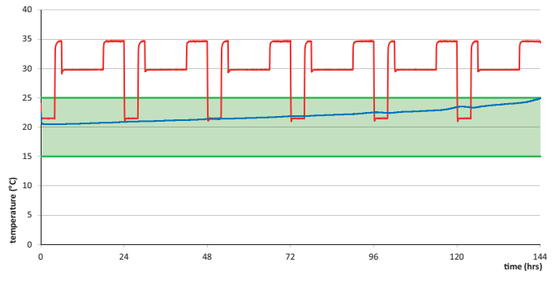
va-Q-proof® 43 Premium data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	570 x 455 x 455	22.4 x 17.9 x 17.9	400 x 300 x 300	15.7 x 11.8 x 11.8	36	27.7	61.1	120	1200
va-Q-accu +05G[2]	570 x 455 x 455	22.4 x 17.9 x 17.9	400 x 300 x 300	15.7 x 11.8 x 11.8	36	27.4	60.4	> 144	> 3586
va-Q-accu -21G[2]	570 x 455 x 455	22.4 x 17.9 x 17.9	400 x 300 x 300	15.7 x 11.8 x 11.8	36	35.1	77.4	≥ 129	≥ 6411
va-Q-accu -32G[2]	570 x 455 x 455	22.4 x 17.9 x 17.9	400 x 300 x 300	15.7 x 11.8 x 11.8	36	37.4	82.5	≥ 118	≥ 7066

Real test examples

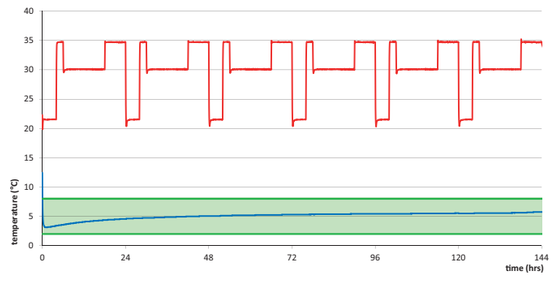
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **143 hours**
- Temp x time: **1430 KelvinHours**



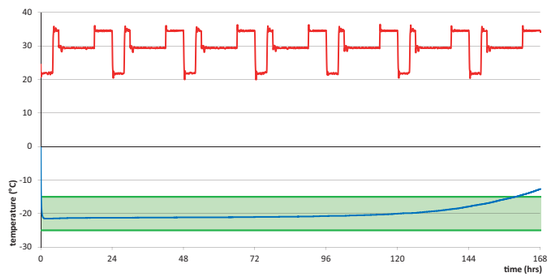
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **> 144 hours**
- Temp x time: **> 3629 KelvinHours**



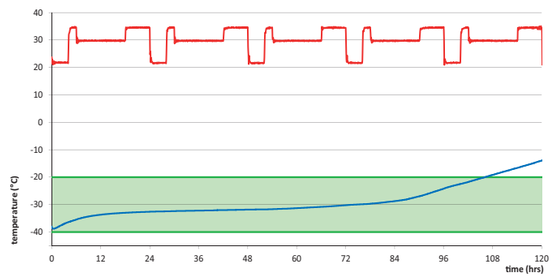
With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **159 hours**
- Temp x time: **7902 KelvinHours**



With va-Q-accu -32G[2]

- Time between -40.0 °C and -20.0 °C: **106 hours**
- Temp x time: **6328 KelvinHours**



[1] The easy way to reliably compare thermal packaging solutions: More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

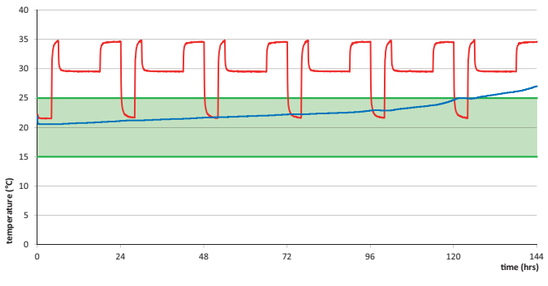
va-Q-proof® 57 Standard data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	555 x 565 x 455	21.9 x 22.2 x 17.9	420 x 420 x 320	16.5 x 16.5 x 12.6	57	26.8	59.1	≥ 119	≥ 1178
va-Q-accu +05G[2]	555 x 565 x 455	21.9 x 22.2 x 17.9	420 x 420 x 320	16.5 x 16.5 x 12.6	57	26.5	58.4	≥ 113	≥ 2791
va-Q-accu -32G[2]	555 x 565 x 455	21.9 x 22.2 x 17.9	420 x 420 x 320	16.5 x 16.5 x 12.6	57	34.8	76.7	≥ 78	≥ 4649

Real test examples

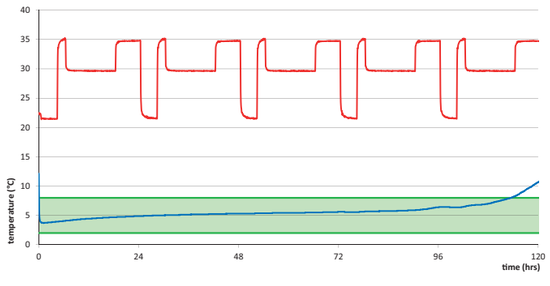
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **120 hours**
- Temp x time: **1188 KelvinHours**



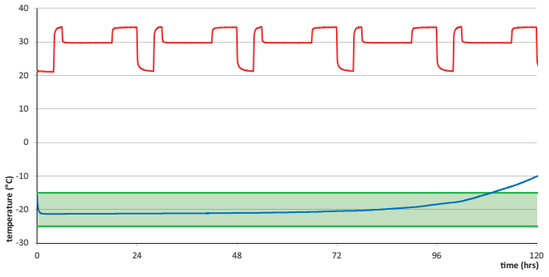
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **114 hours**
- Temp x time: **2816 KelvinHours**



With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **109 hours**
- Temp x time: **5417 KelvinHours**



ambient — center of good — requested range

[1] The easy way to reliably compare thermal packaging solutions: More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

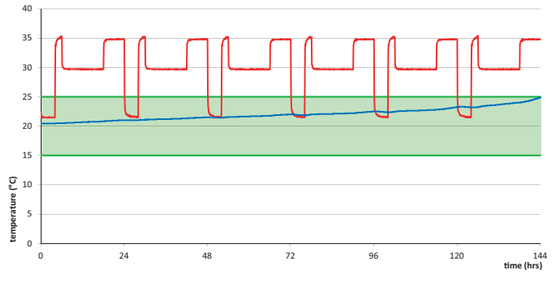
va-Q-proof® 57 Premium data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	555 x 565 x 455	21.9 x 22.2 x 17.9	400 x 400 x 300	15.7 x 15.7 x 11.8	48	32.8	72.3	> 144	> 1426
va-Q-accu +05G[2]	555 x 565 x 455	21.9 x 22.2 x 17.9	400 x 400 x 300	15.7 x 15.7 x 11.8	48	32.5	71.7	> 144	> 3571
va-Q-accu -21G[2]	555 x 565 x 455	21.9 x 22.2 x 17.9	400 x 400 x 300	15.7 x 15.7 x 11.8	48	41.8	92.2	≥ 143	≥ 7207
va-Q-accu -32G[2]	555 x 565 x 455	21.9 x 22.2 x 17.9	400 x 300 x 300	15.7 x 15.7 x 11.8	48	44.5	98.1	≥ 111	≥ 6627

Real test examples

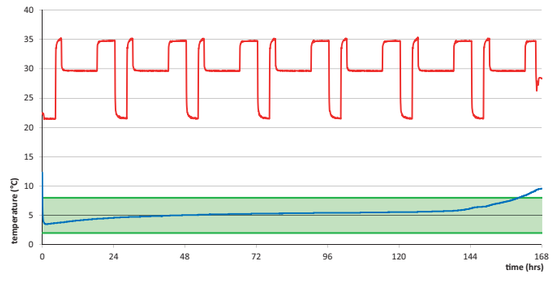
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **> 144 hours**
- Temp x time: **> 1440 KelvinHours**



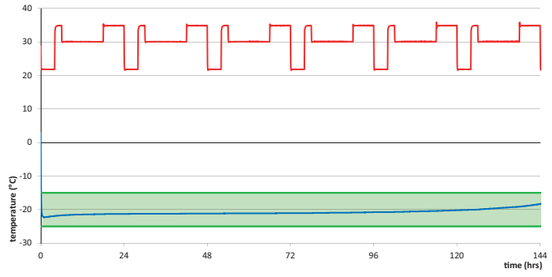
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **160 hours**
- Temp x time: **3968 KelvinHours**



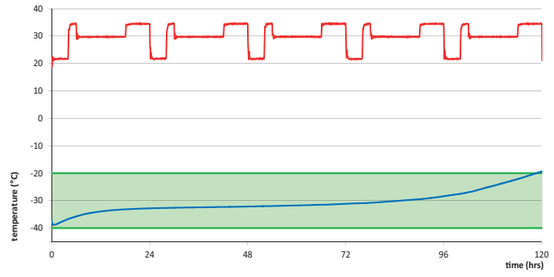
With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **> 144 hours**
- Temp x time: **> 7243 KelvinHours**



With va-Q-accu -32G[2]

- Time between -40.0 °C and -20.0 °C: **119 hours**
- Temp x time: **7116 KelvinHours**



ambient — center of good — requested range

[1] The easy way to reliably compare thermal packaging solutions: More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

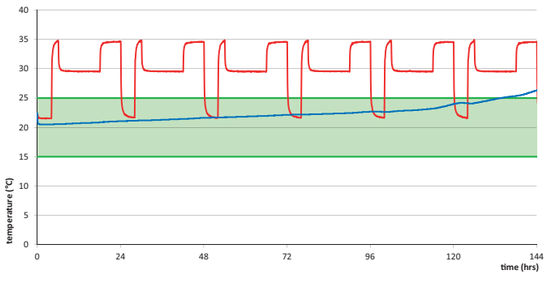
va-Q-proof® 74 Standard data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	555 x 560 x 555	21.9 x 22.0 x 21.9	420 x 420 x 420	16.5 x 16.5 x 16.5	74	31.0	68.3	> 144	> 1411
va-Q-accu +05G[2]	555 x 560 x 555	21.9 x 22.0 x 21.9	420 x 420 x 420	16.5 x 16.5 x 16.5	74	30.8	67.9	≥ 120	≥ 3000
va-Q-accu -21G[2]	555 x 560 x 555	21.9 x 22.0 x 21.9	420 x 420 x 420	16.5 x 16.5 x 16.5	74	38.1	84.0	≥ 118	≥ 5876
va-Q-accu -32G[2]	555 x 560 x 555	21.9 x 22.0 x 21.9	420 x 420 x 420	16.5 x 16.5 x 16.5	74	40.2	88.6	≥ 78	≥ 4649

Real test examples

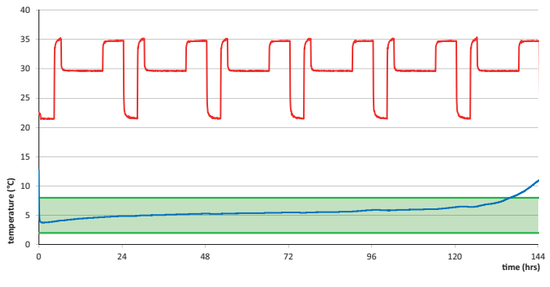
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **134 hours**
- Temp x time: **1300 KelvinHours**



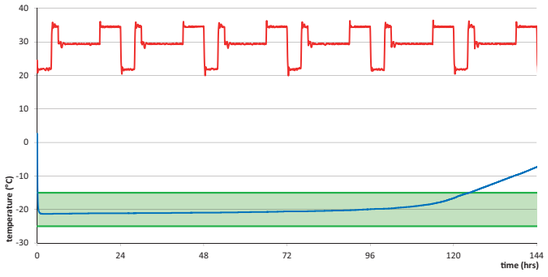
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **136 hours**
- Temp x time: **3373 KelvinHours**



With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **125 hours**
- Temp x time: **6200 KelvinHours**



ambient — center of good — requested range

[1] The easy way to reliably compare thermal packaging solutions:
More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

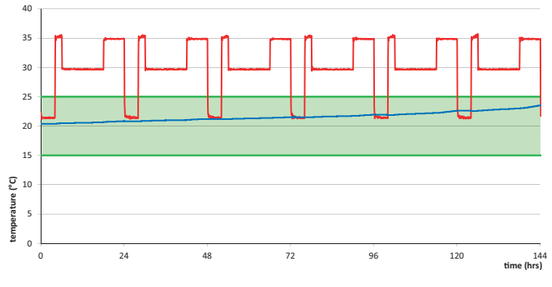
va-Q-proof® 74 Premium data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	555 x 560 x 555	21.9 x 22.0 x 21.9	400 x 400 x 400	15.7 x 15.7 x 15.7	64	38.4	84.7	≥ 144	≥ 1426
va-Q-accu +05G[2]	555 x 560 x 555	21.9 x 22.0 x 21.9	400 x 400 x 400	15.7 x 15.7 x 15.7	64	38.0	83.8	> 144	≥ 3586
va-Q-accu -21G[2]	555 x 560 x 555	21.9 x 22.0 x 21.9	400 x 400 x 400	15.7 x 15.7 x 15.7	64	48.9	107.8	> 144	> 7214
va-Q-accu -32G[2]	555 x 560 x 555	21.9 x 22.0 x 21.9	400 x 400 x 400	15.7 x 15.7 x 15.7	64	52.0	114.6	≥ 102	≥ 6089

Real test examples

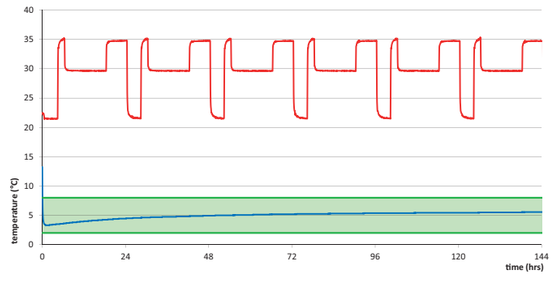
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **> 144 hours**
- Temp x time: **> 1440 KelvinHours**



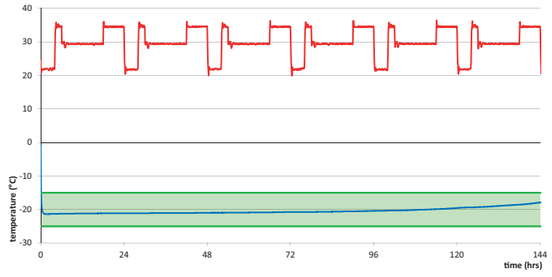
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **> 144 hours**
- Temp x time: **> 3600 KelvinHours**



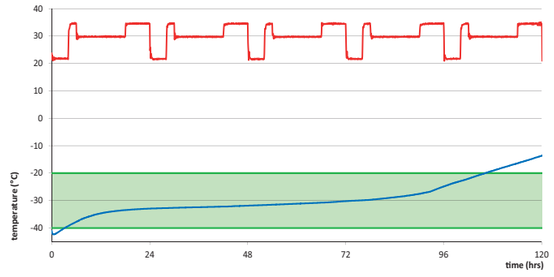
With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **> 144 hours**
- Temp x time: **> 7171 KelvinHours**



With va-Q-accu -32G[2]

- Time between -40.0 °C and -20.0 °C: **108 hours**
- Temp x time: **6448 KelvinHours**



ambient — center of good — requested range

[1] The easy way to reliably compare thermal packaging solutions:
More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

va-Q-proof® 110 P Standard data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	910 x 700 x 700	35.8 x 27.6 x 27.6	670 x 470 x 395	26.4 x 18.5 x 15.6	124	55.2	121.7	≥ 154	≥ 1478
va-Q-accu +05G[2]	910 x 700 x 700	35.8 x 27.6 x 27.6	670 x 470 x 395	26.4 x 18.5 x 15.6	124	54.8	120.8	≥ 141	≥ 3483
va-Q-accu -21G[2]	910 x 700 x 700	35.8 x 27.6 x 27.6	670 x 470 x 395	26.4 x 18.5 x 15.6	124	65.7	144.8	≥ 109	≥ 5406

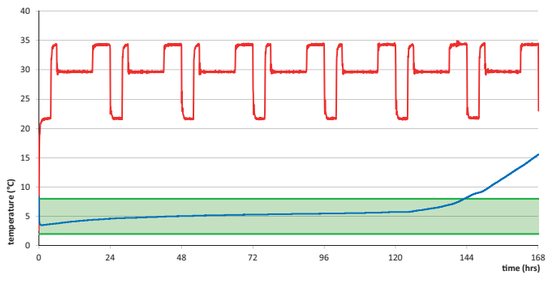
Real test examples

With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **165 hours**
- Temp x time: **1584 KelvinHours**

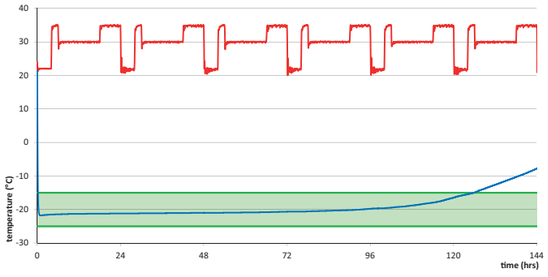
With va-Q-accu +05G[2]

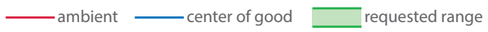
- Time between +2.0 °C and +8.0 °C: **144 hours**
- Temp x time: **3571 KelvinHours**



With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **126 hours**
- Temp x time: **6287 KelvinHours**





[1] The easy way to reliably compare thermal packaging solutions:
More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

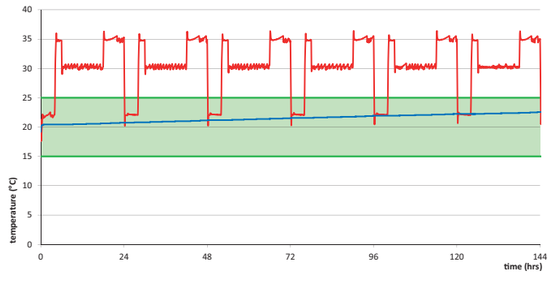
va-Q-proof® 110 P Premium data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	910 x 700 x 700	35.8 x 27.6 x 27.6	650 x 450 x 375	25.6 x 17.7 x 14.8	110	66.1	145.7	> 144	> 1498
va-Q-accu +05G[2]	910 x 700 x 700	35.8 x 27.6 x 27.6	650 x 450 x 375	25.6 x 17.7 x 14.8	110	65.5	144.4	> 144	> 3600
va-Q-accu -21G[2]	910 x 700 x 700	35.8 x 27.6 x 27.6	650 x 450 x 375	25.6 x 17.7 x 14.8	110	81.6	179.9	> 144	> 7214
va-Q-accu -32G[2]	910 x 700 x 700	35.8 x 27.6 x 27.6	650 x 450 x 375	25.6 x 17.7 x 14.8	110	86.3	190.3	≥ 121	≥ 7260

Real test examples

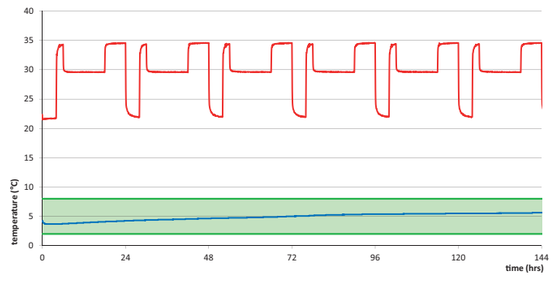
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **> 144 hours**
- Temp x time: **> 1498 KelvinHours**



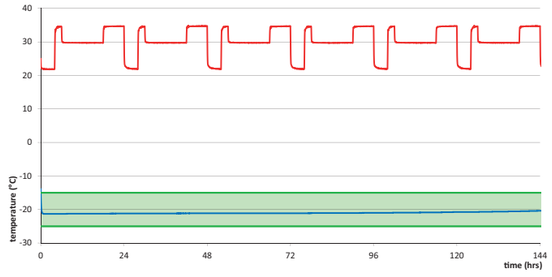
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **> 144 hours**
- Temp x time: **> 3600 KelvinHours**



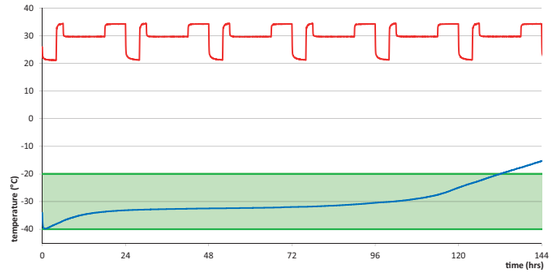
With va-Q-accu -21G[2]

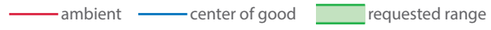
- Time between -25.0 °C and -15.0 °C: **> 144 hours**
- Temp x time: **> 7214 KelvinHours**



With va-Q-accu -32G[2]

- Time between -40.0 °C and -20.0 °C: **132 hours**
- Temp x time: **7880 KelvinHours**





[1] The easy way to reliably compare thermal packaging solutions:
More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

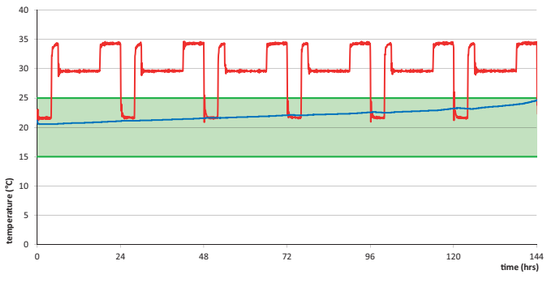
va-Q-proof® 240 P Standard data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	1120 x 900 x 760	44.1 x 35.4 x 29.9	870 x 670 x 453	34.3 x 26.4 x 17.8	264	87.9	193.8	≥ 135	≥ 1286
va-Q-accu +05G[2]	1120 x 900 x 760	44.1 x 35.4 x 29.9	870 x 670 x 453	34.3 x 26.4 x 17.8	264	87.3	192.5	> 130	≥ 3237
va-Q-accu -21G[2]	1120 x 900 x 760	44.1 x 35.4 x 29.9	870 x 670 x 453	34.3 x 26.4 x 17.8	264	104.8	231.0	≥ 102	≥ 5090

Real test examples

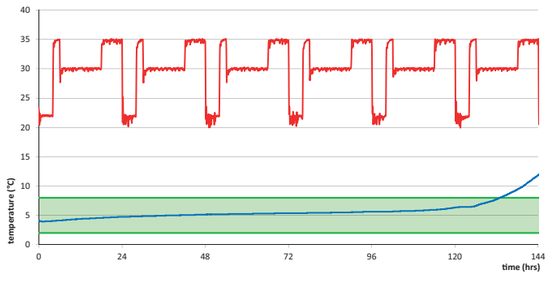
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **> 144 hours**
- Temp x time: **> 1382 KelvinHours**



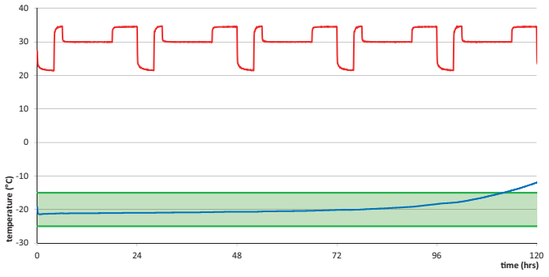
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **133 hours**
- Temp x time: **3312 KelvinHours**



With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **110 hours**
- Temp x time: **5489 KelvinHours**



ambient — center of good — requested range

[1] The easy way to reliably compare thermal packaging solutions: More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

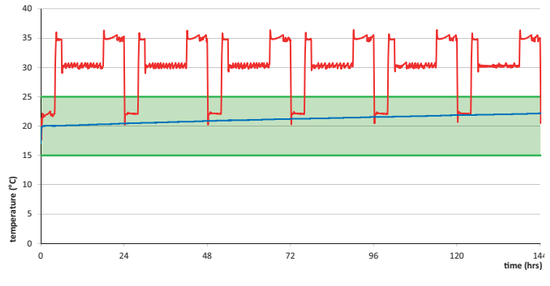
va-Q-proof® 240 P Premium data

Including	External Dimensions (l x w x h) [mm]	[inch]	Internal Product Space (l x w x h) [mm]	[inch]	Payload Volume [L]	Total Weight [kg]	[lbs]	Minimum performance [hours]	[KelvinHours][1]
va-Q-accu +22G[2]	1120 x 900 x 760	44.1 x 35.4 x 29.9	850 x 650 x 433	33.5 x 25.6 x 17.0	240	105.1	232.7	> 144	> 1498
va-Q-accu +05G[2]	1120 x 900 x 760	44.1 x 35.4 x 29.9	850 x 650 x 433	33.5 x 25.6 x 17.0	240	104.2	229.7	> 144	> 3600
va-Q-accu -21G[2]	1120 x 900 x 760	44.1 x 35.4 x 29.9	850 x 650 x 433	33.5 x 25.6 x 17.0	240	130.0	286.0	> 144	> 7214
va-Q-accu -32G[2]	1120 x 900 x 760	44.1 x 35.4 x 29.9	850 x 650 x 433	33.5 x 25.6 x 17.0	240	137.5	303.1	≥ 132	≥ 7867

Real test examples

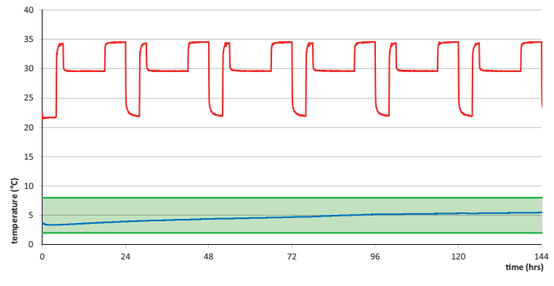
With va-Q-accu +22G[2]

- Time between +15.0 °C and +25.0 °C: **> 144 hours**
- Temp x time: **> 1498 KelvinHours**



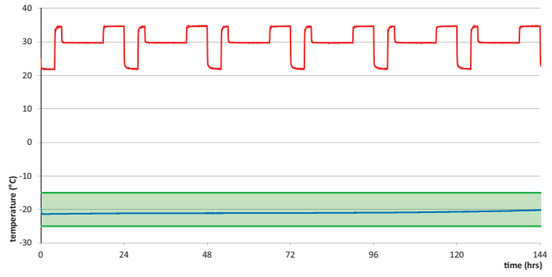
With va-Q-accu +05G[2]

- Time between +2.0 °C and +8.0 °C: **> 144 hours**
- Temp x time: **> 3600 KelvinHours**



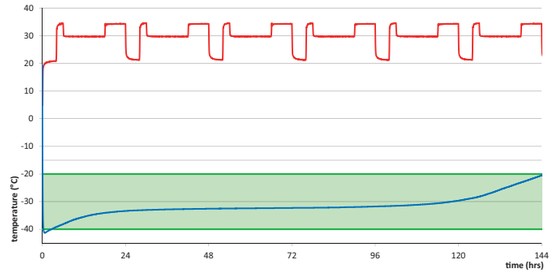
With va-Q-accu -21G[2]

- Time between -25.0 °C and -15.0 °C: **> 144 hours**
- Temp x time: **> 7214 KelvinHours**



With va-Q-accu -32G[2]

- Time between -40.0 °C and -20.0 °C: **> 144 hours**
- Temp x time: **> 8626 KelvinHours**



ambient — center of good — requested range

[1] The easy way to reliably compare thermal packaging solutions: More information at **www.va-Q-tec.com/en/consulting/kelvinhours/**

[2] Qualified test scenario according to ISTA 7D summer

va-Q-tec

ALWAYS THE RIGHT TEMPERATURE

Global contacts:

va-Q-tec AG
Global Headquarter

Alfred-Nobel-Str. 33
97080 Würzburg
Germany

Tel. +49 931 35942-0

info@va-Q-tec.com

va-Q-tec Switzerland AG

c/o PKF Consulting AG
Lavaterstrasse 40
8002 Zürich
Switzerland

Tel +49 931 35942-1611

switzerland@va-Q-tec.com

va-Q-tec UK Ltd.

105 Laker Road
Rochester Airport
Industrial Estate
Rochester, Kent ME1 3QX
United Kingdom

Tel. +44 1634 86 86 18

uk@va-Q-tec.com

va-Q-tec USA Inc.

2221 Cabot Blvd W
Langhorne, PA 19047
United States of America

Tel. +1-201-340-2727

usa@va-Q-tec.com

va-Q-tec Uruguay S.A.

Zonamerica
Business & Technology Park
Edifício Celebra - Oficina 102
Ruta 8 Km 17.500 CP 91600
Montevideo - Uruguay

Tel. +598 25182997

latin.america@va-Q-tec.com

va-Q-tec Korea Ltd.

1706 Ho 2Dong
Ace High-Tech City 775
Gyeongin-ro,
Yeongdeungpo-gu
Seoul, 07299
South Korea

Tel. +82 2 6309-8989

korea@va-Q-tec.com

va-Q-tec Japan G.K.

7F Toranomon 40MT
Building
5-13-1 Toranomon,
Minatoku
Tokyo 105-0001
Japan

Tel. +81 80 59564808

japan@va-Q-tec.com

va-Q-tec Singapore Pte Ltd.

11 Changi South Street 3
B1-01
486122 Singapore
Singapore

Tel. +65 6817-6767

singapore@va-Q-tec.com