

Connex

How long does it really take to freeze a cool pack?

For pharmaceutical and vaccine shipping.

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How long does it take to freeze a water-based coolant pack for pharmaceutical and vaccine shipping?

Properly conditioned coolant packs are integral to the temperature-controlled pharmaceutical supply chain. It is important for your logistics planning to know how long it takes to condition your coolant packs and to factor this into your operations.

This handy Topa Thermal Guide shows you how long it can take to freeze a water-based coolant pack, from a single coolant pack to a full pallet-load.*

Correct Coolant Pack Conditioning

Coolant packs form part of the thermal packaging solution, in conjunction with insulated containers, to help ensure products remain at the recommended cold chain temperature range inside the container during transit. It is important to ensure correct coolant conditioning in order to:

Maintain a constant product temperature throughout the shipping distribution, irrespective of differing outside (ambient) temperatures. This is critical as a small change in product temperature can affect product efficacy.

Maximise logistical efficiencies, and

Optimise business operations and processes.

Supply Chain Critical

Coolant packs are usually delivered to operational and logistics teams at an ambient temperature. They are then frozen or conditioned to the required temperature in time to meet packing and shipping deadlines.

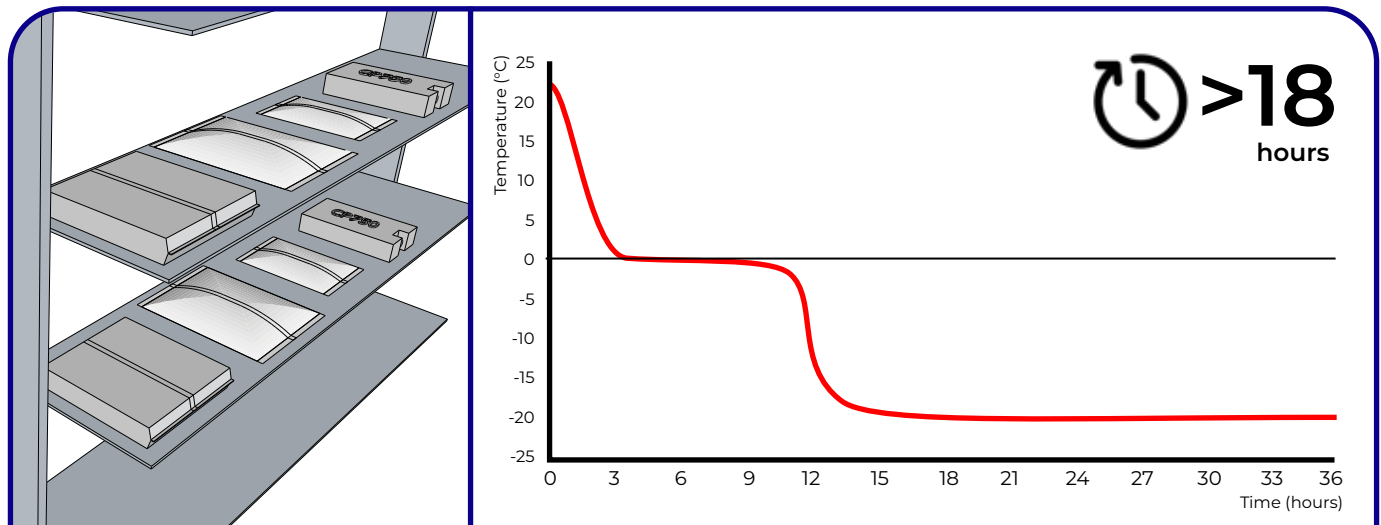
You will see from the illustrations, it takes significantly longer to freeze a case of coolant packs than a single coolant pack, and even longer for a pallet load. Depending on how many conditioned coolant packs are required, operational teams will therefore need to allow adequate time to ensure they are correctly prepared for use and ready to go. If not then the temperature controlled packaging will not work in the way it has been qualified for. The effectiveness of the temperature-critical pharmaceutical product may then be compromised.

Therefore it is critical that logistics and operations teams know how long it takes to freeze the required number of coolant packs, and to factor this into their operations.

Water-based coolant packs

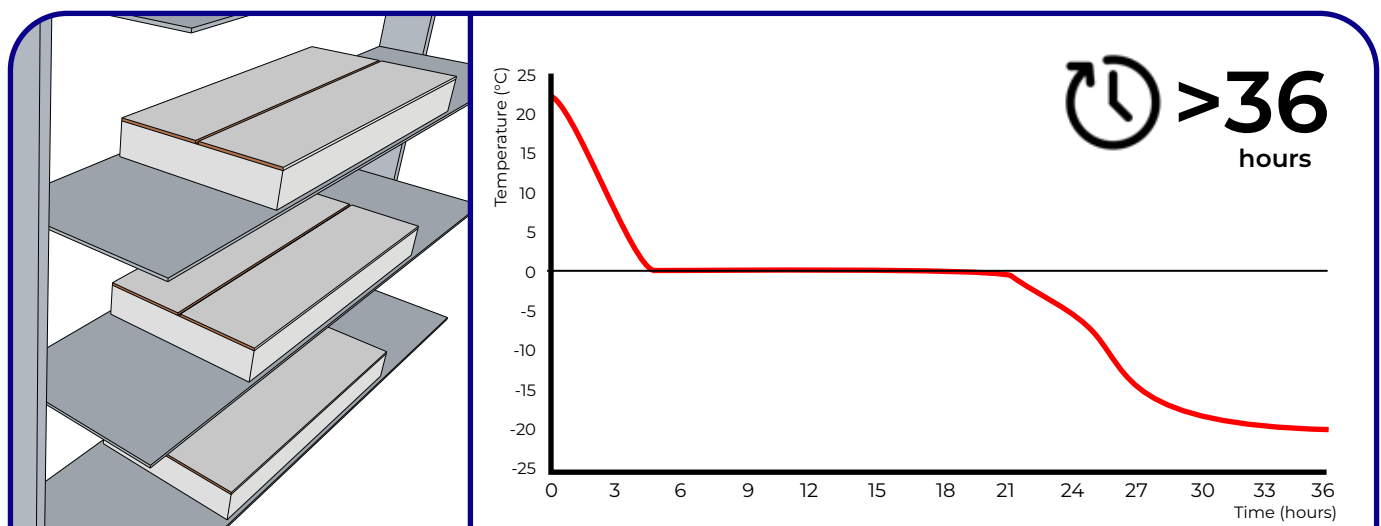
Pre-conditioned target -20°C

Single Coolant Pack



The red line on the graph shows that the temperature of a single coolant pack placed on a shelf in a -20°C freezer went from 22°C to 0°C over a period of 3 hours. The water then went through 'phase change', changing from water to solid. Water-based coolant packs conditioned in single units take up to 18 hours to reach -20°C.

Multi-Coolant Pack Sleeve

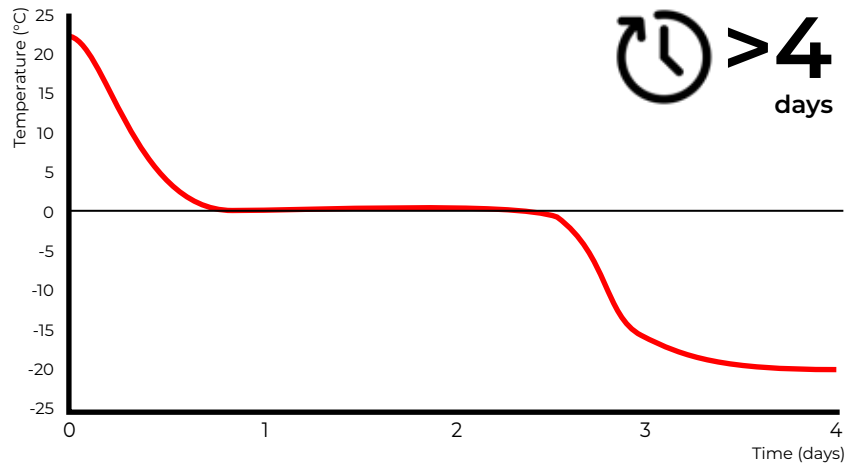
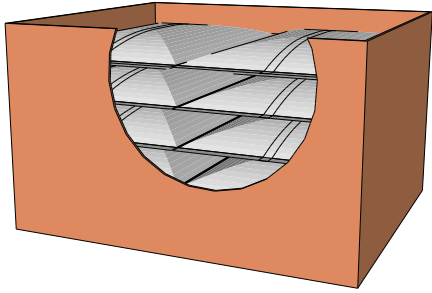


Instead of single coolant packs, some insulated packaging solutions incorporate multi-coolant pack sleeves. In this scenario, where there are multiple coolant packs in each sleeve, freezing time duration is doubled. Water-based coolant packs conditioned in multi-coolant pack sleeves take up to 36 hours to reach -20°C.

Water-based coolant packs

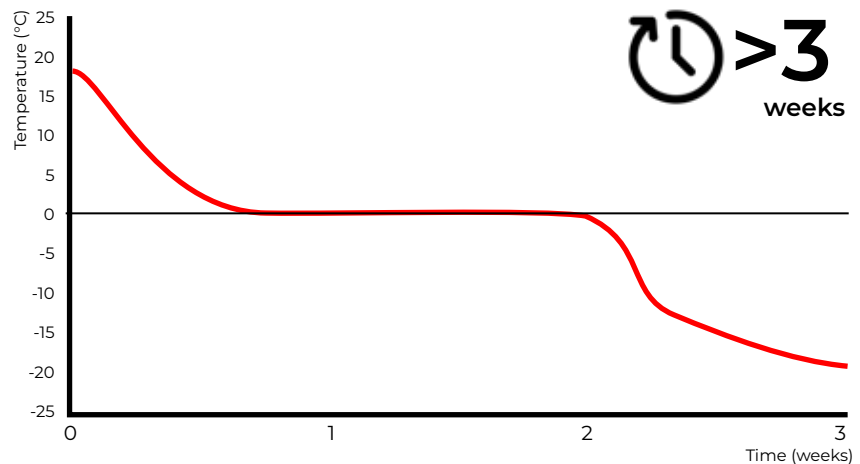
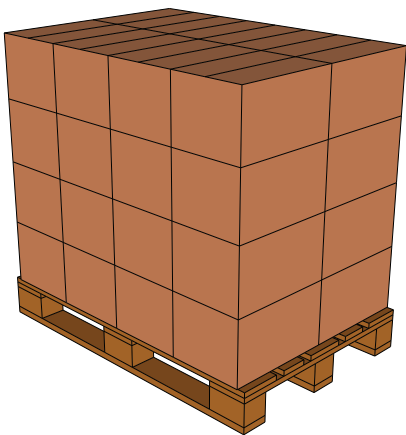
Pre-conditioned target -20°C

Case of Coolant Packs



Coolant packs can also be conditioned in multiples, by the case load. In this scenario a case of coolant packs is easily carried from pallet to freezer shelf, and will take several days to reach the required temperature of -20°C. Water-based coolant packs conditioned together in cases take up to 4 days to reach -20°C.

Full Pallet of Coolant Packs



In the event of larger distribution requirements you may need to freeze a full pallet of coolant packs at the same time. This scenario has very important implications on your logistics planning, requiring many weeks to condition a pallet-load of coolant packs. Water-based coolant packs conditioned as a full pallet-load take up to 3 weeks to reach -20°C.

Summary

A few words of advice when conditioning coolant packs:

1. Conditioning times will differ depending on the number of coolant packs you place into a freezer.
2. The size and type of coolant that you load will also affect its freezing time.
3. Ensure adequate air circulation around the coolant packs to maximise freezer airflow and increase consistency of conditioning. This will decrease risk of product damage.
4. Be aware that loading bulk ambient temperature coolant packs into a freezer can impact the internal temperature of the freezer.
5. Carefully handle the conditioned coolants from freezer to thermal container

We offer coolant packs in a wide variety of temperatures, sizes and encapsulation types to suit your need and our team of thermal packaging specialists is on hand to help with any queries you may have.

- Flexible Gel Packs
- Semi-rigid Foam Bricks
- Moulded Bottle Pack
- Large format Sleeves



Topa Thermal is a part of the Topa group, with a 100-year legacy providing industrial and protective packaging, and supply chain services. A leader in thermal packaging for over 30 years, we engineer thermal packaging solutions and services to keep valuable and temperature sensitive products within a safe temperature range during transit.

**For help and advice contact our thermal packaging specialists on
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