

Cold Chain Case Study

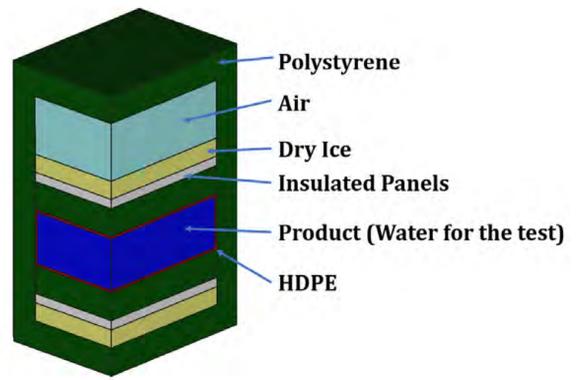
Packaging Testing and Redesign

Client Needs

One of the top 10 Pharmaceutical/Medical Device companies approached Adept to remedy a design failure that was causing one of their shippers to fail to keep the product at the required temperature throughout the distribution environment.

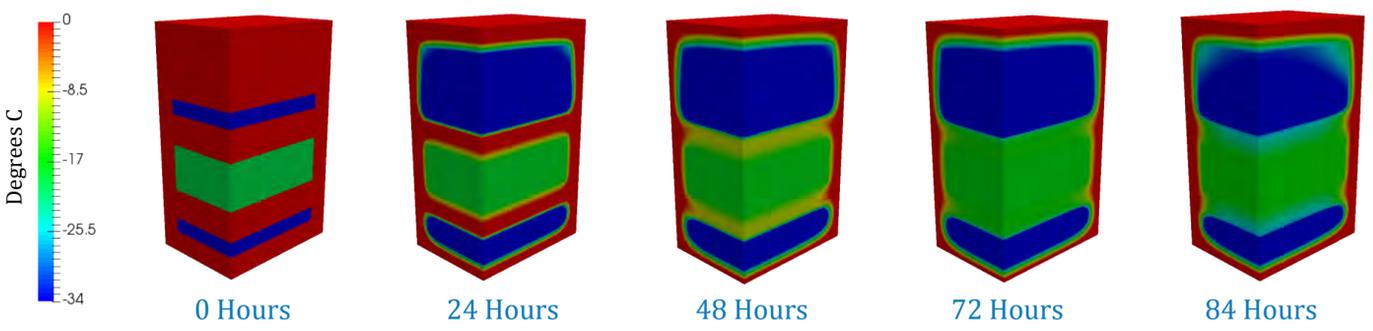
Due to a shipping lane change, the product had to be kept cold longer than the package was originally designed for.

Original Design



Challenges

The product being shipped was required to stay between -20°C and -34°C for 84 hours. The passive cold chain shipper had a temperature excursion during the shipment. The product was reaching temperatures of -19°C before it reached its destination.



The request from the client was to redesign the cold chain shipper to adequately insulate the product, so it reached its destination at the correct temperature, while utilizing existing materials.

Steps Taken by Adept

Adept considered multiple approaches to solve the problem.

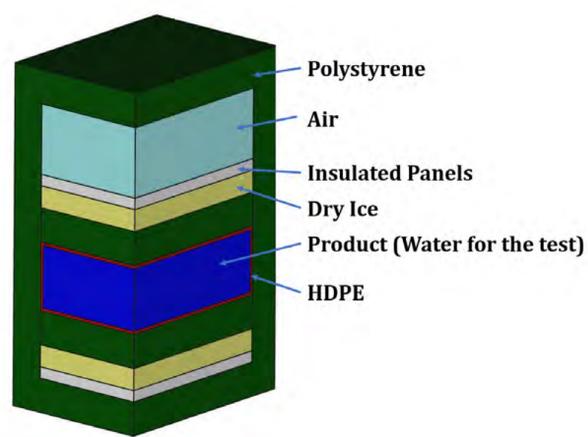
Approach 1:

Through virtual thermal analysis, the initial approach was to condition the materials at a colder initial temperature to see if the shipper would maintain the required temperature throughout the duration. We tried two different conditioning temperatures (-25° , -30°) to attempt to maintain the required temperature. Neither temperature achieved the desired result. It had no effect on the final temperature.

Approach 2:

Next, Adept did a virtual redesign of the shipper. This redesign called for redistributing the components within the container. By moving the dry ice panel closer to the foam and transitioning the vacuum insulated panel further away. It was initially designed this way because the engineer thought the dry ice would make the product too cold. This solved the problem. It was able to maintain a temperature of between -20° and -34° for the duration of the shipment.

Adept Redesign



Results

- » Using virtual testing, we were able to complete all of the design testing to evaluate which approach would and wouldn't work without wasting any of the product.
- » All of the tests were performed by Adept, which also saved the client time and expenses, eliminating the need to run over a months worth of physical testing.
- » Our client is able to use the new shipping configuration with complete success.

